Time after time

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Publication date:
2014

Document Version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Ligthart, H. D. (2014). *Time after time: Collaboration practices in and across temporary organizations*. Ridderprint.

TIME AFTER TIME:

COLLABORATION PRACTICES IN AND ACROSS TEMPORARY ORGANIZATIONS

ISBN: 987-90-5335-823-8

Printed by Ridderprint, Ridderkerk

Time after time:

Collaboration practices in and across temporary organizations

Proefschrift

ter verkrijging van de graad van doctor aan Tilburg University, op gezag van de rector magnificus, prof. dr. Ph. Eijlander, in het openbaar te verdedigen ten overstaan van een door het college voor promoties aangewezen commissie in de aula van de Universiteit op vrijdag 11 april 2014 om 10.15 door

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Preface

This dissertation is the result of my work as a PhD student at the Center for Innovation Research (CIR) and Department of Organization Studies (OS) at Tilburg University. From October 2009 until October 2013 I have worked with much pleasure and joy at this university. It was exactly the pleasure and joy that I was missing at my previous job, which was one of the reasons for me to start pursuing an academic career. Looking back on the past four years I can only conclude that I made the right choice. I strongly believe the opportunity to do my PhD at Tilburg University could not have come at a better time. My PhD has given me the chance to develop my professional, academic skills and to discover the fascinating world of the Dutch shipbuilding industry, which is the industry in which I carried out my empirical research. I find it quite amazing how multiple organizations collaborate under high levels of time pressure and yet succeed in delivering complex vessels on time to end customers. I supervised a small building project myself – the renovation of our bathroom – which is organizationally and technically much less complex. However, the bathroom was ready two and a half weeks after the planned date. Given that I planned the process to take no longer than seven days, it was a significant overrun. One may understand how proud I am that I did manage to finish my PhD on time.

Writing a doctoral dissertation is not a solitary matter as some outsiders may tend to believe. Over the past four years I have engaged in close collaboration with my supervisors, fellow PhD students, other colleagues from CIR and the OS Department, and various people active in the Dutch shipbuilding industry. I would like to sincerely thank each and every one who in whatever way helped and supported me during the realization of my dissertation. Of course there are a number of individuals who deserve my special gratitude. First and foremost my thanks go to my supervisors/promoters Leon Oerlemans and Niels Noorderhaven. Leon and Niels, I hope and also believe you know how lucky I feel that you were my supervisors. Your guidance, flexibility, and – not in the last place – humor have made my years as a PhD gone by in a blink of an eye. Special thanks also go to my co-promoter Roel Rutten. Roel, I want to thank you for being one of the guys who brought in the shipbuilding project and also for being the first in line to give me the opportunity to start as a PhD student. Next, for all their efforts I want to thank the other members of my promotion committee – in alphabetical order on first-name basis – Jonas Söderlund, Martyna Janowicz-Panjaitan, Rolf Lundin, and Ubald

Nienhuis. Jonas, Martyna, Rolf, Ubald, on several occasions I have had the pleasure to work with you and hopefully our paths will meet again in the future. I am very proud of having you all in my committee. Finally, I have had great colleagues at the department of Organization Studies, so I simply want to thank everyone for a wonderful time. There is however one person that I want to mention separately, my fellow PhD student and shipbuilding companion Roland Levering. Roland, I want to thank you for teaming up with me as we discovered the Dutch shipbuilding industry. I consider our countless laughs to be continuous highlights of our period as PhD students. I hope you do well in the future.

Without doubt, during my PhD the greatest moments occurred in my private life. In 2011 I married with the love of my life, Angela. And to make our happiness complete, in 2012 our daughter Liss was born. Angela and Liss, thanks to you my days are always filled with joy. I hope we will continue to love each other for a long, long time.

Tilburg, March 2014

Rik

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Management Summary

In 2008 the Dutch shipbuilding industry launched 'Integral Cooperation', a large-scale and government-sponsored improvement program. This program originated from the sector's belief that the quality of their interorganizational collaboration practices was suboptimal. In short, the main problem was that specialization had led to fragmentation in the value chain, conflicting interests among collaboration partners, and opportunism, all of which impeded project-based collaboration and related outcomes.

Between October 2011 and June 2013 we closely examined the production of two organizationally and technically complex vessels produced in the Netherlands. The main goal of our examination was to acquire a better understanding of the interorganizational collaboration practices between the participating organizations (i.e., one shipyard and eight subcontractors) in these two shipbuilding projects. Specifically, we looked at the flexibility behaviors displayed by the project participants (Chapter 2 in this dissertation) and we studied how and why learning across the two projects did or did not occur (Chapter 3 in this dissertation). Additionally, at the industry level we examined changes and stabilities in collaboration practices and demands between 1950 and 2010 (Chapter 1 in this dissertation). Combining the results from these empirical undertakings, we propose a number of recommendations to improve the quality of collaboration in shipbuilding projects in specific and in multi-organizational projects in general.

A major recommendation is to strive for repeated collaboration with the same partners. For the shipyard and subcontractors under study, this repeated collaboration is routine but it is not a widespread phenomenon in Dutch shipbuilding. When partners share a history of collaboration and expect to work together in the future, they will be less inclined to focus predominantly on their own interests during collaboration than when such 'shadows of the past and future' are absent. Instead, they will be motivated to not only take into account their own interests but also the interests of their partners and thus the overall project interest. Also, repeated collaboration enables participants to develop collaboration routines so that collaboration can become more effective and efficient. For example, partners know what they can expect from each other and can anticipate their partners' behavior in advance. Next to more efficient collaboration, such learning effects can also result in a lowering of failure costs.

A possible downside of this recommendation is that when subcontractors get the idea that they will be selected by the shipyard on future projects anyhow, they will no longer fully try to make the best of collaboration because they are more or less assured of future work. In other words, in the absence of the incentive to be a good partner, partners can become focused more on pursuing self-interests than on overall project interests. Another downside of long-term collaboration between organizations we found is that organizations may stop looking for alternative ways of collaboration simply because they are used to a certain way of work and do not have the believe that these alternatives can actually improve collaboration. We find that it is very difficult and sometimes impossible to break away from historically developed routines, even although these routines lead to sub-optimal collaboration. In trying to change present behavior then, one should always to a certain extent take into account and deal with what happened in the past.

Another recommendation for higher management is to assure that for each single project the coordination capacity (i.e., the number of individuals specifically employed to manage and organize the efforts of the various organizations and individuals) is sufficient. An increase of coordination capacity initially increases costs but overall costs are likely to be lower due to among other things better communication, fewer misunderstandings and earlier detection of possible showstoppers. The challenge lies in finding the right balance: a too low coordination capacity will make project participants unaware of what is going in other parts of the projects, while a too high coordination capacity will make it unclear where one has to find information or who possesses the 'right' information.

Related to this, a third recommendation is that organizations should try to find a balance between formal and informal collaboration. Informal collaboration (e.g., not writing down all agreements but relying mainly on oral discussions and mutual adjustments) can increase the speed of collaboration but carries the danger that things get forgotten or that conflicts arise about earlier agreements. The weaknesses of informal collaboration are the strengths of formal collaboration. Formal collaboration minimizes the risk that there is conflict about agreements but can make collaboration a slow and bureaucratic process. The optimal level of formal and informal collaboration is likely to differ for each interorganizational project, but is at least partly dependent on prior relations among organizations and expectations of future interaction among them. In the presence of prior ties and expected future ties, we would encourage project participants to rely more on informal collaboration than on formal collaboration, and vice versa.

Finally we want to emphasize the importance of communication. A dominant cause of failure mentioned in many research reports on a multitude of collaboration settings is the lack of communication. In settings in which multiple organizations and individuals are heavily dependent on each other such as in shipbuilding projects, communication is key. Open and constant communication is critical to bring the project to a successful end. Repeated collaboration as suggested above improves communication as trust and coordination routines can be developed over multiple collaborations. An optimal coordination capacity can further aid in smoothening communication, as can early involvement of key partners.

In sum, repeated collaboration, sufficient coordination capacity, a balance between formal and informal collaboration, and open communication are all instruments to improve interorganizational collaboration. Nevertheless, even when these instruments are implemented, successful collaboration can be hampered by the inherently conflicting interests partners may have in each single project. Repeated collaboration can partly cover for this, but not sufficiently. A formidable challenge that remains then is to find ways to further align interests in order to optimize interorganizational collaboration.

1. Introduction

In 2008 the Dutch shipbuilding industry launched a large-scale and government-sponsored improvement program called 'Integral Cooperation'. Two of the leading Dutch shipyards and various subcontractors participated in the program. It originated from the sector's acknowledgement that the quality of interorganizational collaboration practices in the sector was suboptimal. In short, the main problem was that specialization had led to fragmentation in the value chain and conflicting interests among collaboration partners, which impeded project-based collaboration and related outcomes. The overall goal of the program was to improve interorganizational collaboration in order to stay ahead of international competition and to secure the continuity of the Dutch maritime cluster.

A group of researchers of Tilburg University participated in the program, studying contemporary collaboration practices in the Dutch shipbuilding industry. Collaboration in the sector is organized in multi-organizational projects. These projects are temporary settings in which multiple organizations – typically one shipyard acting as the lead organization and various subcontractors – work together for a predefined period of time to produce complex vessels. Because of their temporary nature, such collaboration settings can be regarded as 'temporary organizations'. Despite an increasing prevalence of temporary organizations it has been observed that many questions concerning the functioning and outcomes of temporary organizations remain unanswered.

These observations form the rationale for this dissertation, which examines collaboration practices in and across multi-organizational shipbuilding projects from the perspective of temporary organizations.

1.1 Temporary organizations: What's new?

Nowadays many organizations are facing rapidly changing environmental conditions like increasing levels of technological and market uncertainty (Jones & Lichtenstein, 2008). As one of the ways to deal with these conditions, in several industries organizations more and more turn to multiple external partners for the production of their complex products and services (Bakker et al., 2011a; Gil, Pinto, & Smyth, 2011; Hobday, 2000; Martinsuo & Ahola, 2010; Maurer, 2010, Ruuska et al., 2013). These multi-organizational collaborations are often of a temporary nature, causing scholars to describe them as temporary organizations. In

temporary organizations, the duration of collaboration is "explicitly and *ex ante* fixed either by a specific date or by the attainment of a predefined task or condition" (Janowicz-Panjaitan, Cambré, & Kenis, 2009, p. 2, emphasis in original). This temporary nature is considered the central and unique feature of temporary organizations (Grabher, 2002a; Söderlund, 2004) and sets them apart from more commonly examined interorganizational collaborations like alliances and joint ventures, which are 'built to last' (Greve et al., 2010). Temporary organizations (TOs from here on) are increasingly prevalent (Bakker et al., 2011a; Kenis, Janowicz-Panjaitan, & Cambré, 2009; Malone & Laubacher, 1998), but they are not new phenomena. The presence of TOs has been observed and acknowledged in a myriad of industries, including construction (Eccles, 1981), film (Bechky, 2006), theatre (Goodman & Goodman, 1976), biotechnology (Powell, Koput, & Smith-Doerr, 1996), shipbuilding (Ahola et al., 2008) and advertising (Grabher, 2002b), among others. Half a century ago Miles (1964) was one of the first to discuss social and work life in terms of temporary systems like conferences, juries, military battles and psychotherapeutic settings. He argued that the central characteristic of these systems was that in the foreseeable future they would cease to exist. While initially the number of scholarly works on TOs grew steadily, this number has grown exponentially over the past 25 years (Bakker, 2010). A central tenet of these works is that the temporary involvement of multiple, interdependent organizations brings benefits to participating organizations but at the same time poses formidable challenges to collaboration in and across TOs (Dille & Söderlund, 2011; Jones, Hesterly, & Borgatti, 1997). Still there remains room to explore the functioning and outcomes of TOs. This may be because only quite recently the assumption that TOs are a crucial form of contemporary organizing, and thus require academic attention, has become widespread (Grabher, 2002a; Sydow, Lindkvist, & DeFillippi, 2004). To answer the question in the heading of this section: TOs are not new phenomena, but the academic attention devoted to the studying of TOs is (Bakker et al., 2011a; Grabher, 2002a).

Before turning to the theoretical and practical problems addressed by this dissertation, it is deemed useful to provide some demarcations. The focus of this dissertation is on collaboration practices in and across interorganizational TOs. We[1] define collaboration practices as TO participants' routine actions for coordinating activities and relations (Kostova & Roth, 2002; Windeler & Sydow, 2001). In this dissertation these behaviors are next to

[1] I like to think of this dissertation as a collective effort of my supervisors and myself, therefore I prefer to speak in plural, except in this footnote.

coordination related to among others trusting behaviors among TO participants, the flexibility displayed towards each other, and (interorganizational) learning processes. Interorganizational TOs are defined as *goal-directed temporary systems of at least three legally autonomous but functionally interdependent organizations with different skills and expertise who collaborate to accomplish complex tasks in an ex ante defined limited amount of time* (Hobday, 2000; Janowicz-Panjaitan et al., 2009; Jones & Lichtenstein, 2008; Schwab & Miner, 2008; Sydow & Staber, 2002). This implies that *intra*organizational TOs are excluded. TOs are of an intraorganizational nature when occurring within a single, non-temporary organization (Packendorff, 1995). The focus of this dissertation however is on interorganizational TOs which are, in comparison to intraorganizational TOs, significantly understudied (Janowicz-Panjaitan et al., 2009; Lundin & Söderholm, 1995). Interorganizational TOs comprised of only two organizations are excluded as well. TOs commonly seem to be populated by a multitude of organizations instead of only two (Oerlemans, de Kok, & de Jong, 2009). Literature assumes that the dynamics of collaboration between three or more organizations are fundamentally different, for instance because they are characterized by generalized instead of direct social exchange (Das & Teng, 2002).

1.2 Research problem

The central theoretical problem addressed in this dissertation concerns the isolation-embeddedness debate in the TO literature. This debate concerns the idea that TOs simultaneously are isolated from and dependent on their environment (Janowicz-Panjaitan et al., 2009). On the one hand the isolation of TOs from their environment has been argued to stimulate goal accomplishment (Miles, 1964). According to this view, collaboration practices in and across TOs are unique, and dependent on the individual TO in question (Löwendahl, 1995; Pinto & Prescott, 1990). On the other hand, it has been argued that TOs are embedded in wider social and historical contexts and dependent on these contexts to accomplish their tasks (Engwall, 2003; Grabher, 2004a). According to this view, TOs are no stand-alone, isolated organizational phenomena. Instead, their functioning should be understood in relation to their environment, and collaboration practices are influenced by forces operating outside of the TO. These contrasting views raise the question which factors contribute to our understanding of collaboration practices in and across TOs.

The central practical problem concerns the widely observed general difficulty of temporary multi-organizational collaboration. In general collaboration practices are often characterized

by slow and painful processes such as partners behaving opportunistically and inefficiency (Dille & Söderlund, 2011; Hardy, Lawrence, & Grant, 2005; Polidoro, Ahuja, & Mitchell, 2011), both impeding the quality of collaboration. In the Dutch shipbuilding industry, similar problems occur. Four specific collaboration problems in Dutch shipbuilding projects concern: (1) the inability to come to more efficient interorganizational collaboration, despite several decades of experience with producing complex vessels through multi-organizational projects; (2) the inflexibility displayed by project participants during project execution as they seem to pursue mainly self-interests (see also Ruuska et al., 2013); (3) the inability to learn across projects, resulting in repeated mistakes and increases in failure costs; and (4) difficulties with coordinating the actions and efforts of interdependent participants while also preventing opportunism. Following up on the theoretical problem, we are interested in the factors that explain these practical collaboration problems, and whether these factors are related to specific TO characteristics, the environment of TOs, or both.

The theoretical and practical problems discussed above show that there are many facets to temporary interorganizational collaboration. This dissertation opens the black box of collaboration practices in and across TOs and simultaneously connects this box with its wider environment. These considerations result in the general research goal and research question below.

1.3 Research goal and research question

The goal of this dissertation is to explore collaboration practices in and across temporary organizations and to contribute to the debate on temporary organizations' isolation from versus dependence on their wider contexts. We answer the following overall research question:

Which factors are critical to our understanding of collaboration practices in and across interorganizational temporary organizations?[2]

[2] We aim to develop parsimonious models, i.e. models with only a limited number of variables which have high explanatory power. In order to identify these 'critical' factors, we focus on those variables that are often mentioned by our respondents during the interviews.

The collaboration problems discussed above give rise to four research sub-questions. These research questions form the focus of the chapters in this dissertation. While the first research question adopts a macro perspective, looking at collaboration practices at the industry level, the other three research questions adopt a micro perspective, zooming in on collaboration practices in and across specific TOs.

First, which factors explain collaboration inertia in a TO-based industry over time? It has been proposed that collaboration practices should be understood not in isolation but in the context of historical developments (Engwall, 2003). Yet current TO literature does not provide us with satisfying answers as it focuses predominantly on singular projects (Engwall, 2003), thereby neglecting the possibility that contemporary collaboration practices are reproduced over time, across a series of TOs (Windeler & Sydow, 2001). It seems much can be gained from exploring history-related explanations of collaboration inertia.

Second, which factors explain (in)flexibility in social interaction in TOs? TOs are commonly praised for providing flexibility across particular instances of collaboration (Bechky, 2006). This flexibility concerns the freedom of lead organizations to rotate the involvement of multiple skilled organizations as new TOs are initiated (Hobday, 2000). But this does not necessarily result in flexibility *in* TOs. Why do TO participants sometimes show flexibility, i.e. adjust their operational plans and behaviors to accommodate the needs of other participants (Heide & Miner, 1992), while on other occasions they show inflexibility by focusing on pursuing (solely) their own interests? Are these drivers related to the specificities of the current TO, or to the social contexts in which the TO operates? A detailed analysis of flexibility within TOs is currently lacking so that our knowledge is limited (Ivens, 2005: Bakker, 2010). Therefore there is an opportunity to explore the factors that determine flexibility and inflexibility in TOs.

Third, why does learning across two specific, subsequent TOs fail or succeed? TOs provide ample learning opportunities as participants bring in specific knowledge and expertise, but the created knowledge may disperse once TO participants disband after task completion (Bakker et al., 2011b). Next to TOs' limited duration, time pressure is often mentioned as a crucial barrier to cross-TO learning (Scarbrough et al., 2004). However, time pressure could be of limited influence when subsequent TOs are populated by the same set of organizations and individuals, who can then function as a project memory (Grabher, 2004b). Also, the limited duration of TOs seems to be less of a problem once knowledge is codified and made available

to others in subsequent TOs (Zollo & Winter, 2002). This suggests that we need alternative explanations for the failure, or success, of cross-TO learning. These explanations may transcend TO-specific explanations of time pressure and limited duration by taking into account the wider social context in which TOs are embedded.

Fourth, in which way does the interorganizational and interpersonal nature of repeated collaboration influence coordination and opportunism in TOs? A growing body of literature holds that shadows of the past and of the future improve coordination and put a hold on opportunism, respectively (Jones & Lichtenstein, 2008; Skilton & Dooley, 2010). Prior ties make TO participants aware of each other's roles and procedures, which facilitates coordination (Eccles, 1981; Gulati, 1995). Expectations of future interaction generate a sense of obligation, making it less likely that TO participants engage in opportunistic behavior in current interactions (Jones et al., 1997). However, most of this literature ignores the difference between interorganizational ties on the one hand and interpersonal ties on the other. Exploring the difference between these two types of ties and their effects on coordination and opportunism is likely to provide new and interesting insights in the complexity of temporary multi-organizational collaboration.

We answer the various research questions from a relational and temporary perspective. The relational perspective (Dyer & Singh, 1998) emphasizes the importance of interorganizational linkages. According to this perspective, these linkages are an organization's critical resources and help understand organizational behavior. Following this perspective, the chapters in this dissertation focus on the collaboration, or interaction, between organizations participating in TOs. Additionally, in line with our intention to view interorganizational collaboration from a temporary perspective, in answering the research questions we pay specific attention to the role of time and time limits (cf. Ancona et al., 2001). This seems particularly useful due to the lack of consensus on what is generally considered the central characteristic of TOs, being limited in time, and how this influences collaboration practices in and across TOs (Bakker, 2010; Janowicz-Panjaitan et al., 2009). We do not theorize in detail on the role of time, but rather use time as an analytical lens by looking at the organizational implications of the time limits present in TOs.

1.4 Methods

The three empirical chapters in this dissertation (Chapter 2, 3, and 4) are based on in-depth, qualitative case studies (Yin, 2003). Case studies are particularly well-suited to explore relatively underexplored territory and to develop theory around it (Eisenhardt, 1989). The reported case studies describe the dynamics present both in and across TOs and contribute to theory building around the functioning and outcomes of TOs. The quantitative details of the case studies can be found in Table 1.1.

Chapter 2 describes the development of collaboration practices in the Dutch shipbuilding industry between 1950 and 2010. Collaboration practices, as well as collaboration demands, have changed considerably over this period. To map these changes, we conducted two interview rounds. In the first round, between April and July 2010, we interviewed active shipbuilders. With active shipbuilders we mean shipyard and subcontractor employees who were at that time actively employed in the industry, and who also participated in the industry's improvement program. These semi-structured interviews gave an indication of contemporary practices and demands in the industry. In the second round, between July 2011 and September 2012, we interviewed retired shipbuilders, i.e. those who were formerly employed in the industry. These interviews painted a story of historical collaboration practices and demands. We combined the results of the two interview rounds. This enabled us to identify changes and stabilities in collaboration practices and demands, and to discover path-dependent explanations for the current suboptimal collaboration practices in the industry.

While Chapter 2 takes a macro-perspective, focusing on collaboration practices and demands at the industry level, the other two empirical chapters employ a micro-perspective, examining collaboration practices in specific TOs. Chapter 3 explores collaboration practices in a single TO, focusing on flexibility behaviors displayed by its participants. The data collection process combined observing the TO participants during weekly project meetings and, on the basis of these observations, conducting semi-structured interviews with the participants as well as their managers (who did not participate in the project meetings). Between October 2011 and June 2012 we observed TO participants during 22 project meetings, resulting in approximately 1,000 observation units. The interviews were held between November 2011 and October 2012.

Chapter 4 builds on Chapter 3, examining the extent to which the organizations and individuals managed to transfer lessons learned across TOs. Chapter 4 also relies on the

combination of observations of TO participants' behavior during project meetings and semi-structured interviews. Between November 2012 and July 2013 we observed behavior during 20 project meetings. This resulted in approximately 700 observation units. The interviews were held in April and May 2013.

TABLE 1.1

Data collection overview

	Data collection method	**Number**	**Average length**
Chapter 2: Continuity and change	Semi-structured interviews	25	60 minutes
Chapter 3: Not so temporary after all	Semi-structured interviews	28	50 minutes
	Observations	22 project meetings	75 minutes
Chapter 4: Better understanding TO amnesia and its cure	Semi-structured interviews	13	40 minutes
	Observations	20 project meetings	60 minutes

The collected data is analyzed in an iterative way, meaning that we continuously switch between collection and analysis (Eisenhardt, 1989; Glaser & Strauss, 1967). The analysis follows the so-called 'Gioia-method' (e.g., Corley & Gioia, 2004; Harrison & Corley, 2011). This is a common method used to execute and present qualitative research (Langley & Abdallah, 2011). The method starts with open coding, i.e. the identification of initial concepts within the data by using language used by the respondents. The next step involves searching for relations among these initial concepts, which are then collapsed into second-order themes. Finally, similar themes are gathered into overarching dimensions.

A major challenge in doing case study research is convincing readers of the credibility, or trustworthiness, of the claims that are made (Corley & Gioia, 2004; Eisenhardt & Graebner,

2007; Glaser & Strauss, 1967). The strength of the Gioia-method is that it shows how we as researchers arrive at theoretical claims which closely match the collected data. We provide in each empirical chapter the so-called data structure, which gives an upfront visualization of how the first-order concepts, second-order themes, and aggregate dimensions are related. We present tables with respondents' quotes to further substantiate our findings. Also, we triangulate the data (Eisenhardt, 1989), not only by combining observations and interviews but also by discussing findings with our respondents, fellow researchers, shipbuilding executives and consultants.

1.5 Dissertation structure

The dissertation continues with the three empirical chapters on the subjects of collaboration inertia, flexibility, and learning, respectively. Partly building on the results of these empirical chapters, next follows a conceptual discussion on the difference between interorganizational and interpersonal ties. Finally, the concluding chapter integrates the findings from the other chapters and formulates an answer to the overall research question and the sub-questions.

2. Continuity and change in interorganizational project practices: The Dutch shipbuilding industry 1950-2010[3]

2.1 Introduction

Jones and Lichtenstein (2008) set the interorganizational project apart from other forms of interorganizational coordination by identifying the temporary nature as its key distinction. This temporary nature is assumed to impact on the processes, practices, and behaviors taking place in these projects. We define interorganizational projects (henceforth IO projects) as three or more organizational actors from distinct organizations working jointly to create a tangible product/service in a limited period of time (based on Jones & Lichtenstein, 2008).[4] Interorganizational collaboration is often characterized by slow and painful processes and leads to mixed results, a phenomenon Huxham (2003, p. 401) terms "collaborative inertia". Dille and Söderlund (2011) adhere to this viewpoint, stating that interorganizational projects "are usually plagued by challenges in terms of both cooperation and coordination and replete with delays" (p. 481). Several studies show that such frictions even lead to failures (Polidoro et al., 2011).

In contemporary Dutch shipbuilding industry, shipyards, subcontractors, and suppliers collaborate in IO projects to produce complex vessels. Recently, industry actors acknowledged that contemporary interorganizational practices (e.g. with regard to communication and knowledge sharing) in Dutch shipbuilding projects are problematic and do not fit well with contemporary interorganizational project demands (related to increased specialization and outsourcing). In this chapter we define IO project practices as project participants' routine actions for coordinating activities and relations (Kostova & Roth, 2002; March & Simon, 1958; Windeler & Sydow, 2001), whereas project demands are seen as

[3] A modified version of this chapter appeared as: Levering, R. C., Ligthart, H. D., Noorderhaven, N. G., & Oerlemans, L. A. G. (2013). Continuity and change in interorganizational practices: The Dutch shipbuilding industry 1950-2010. *International Journal of Project Management, 31*, 735-747. Because IJOPM is a project management journal, in this chapter we speak of interorganizational projects instead of interorganizational TOs.

[4] Note that our focus is explicitly on *multiple* organizations, i.e. three or more, while the definition of Jones & Lichtenstein also encompasses collaboration between two organizations.

environmental conditions (cf. Wiersema & Bantel, 1993) that render certain collaboration practices more or less effective. Environmental, here, refers to the environment in which the project is embedded, for instance competition and technological development. When IO project practices do not match with project demands (i.e., environmental conditions), misfit occurs, and efficiency might suffer (Tushman & Nadler, 1978). To deal with problems caused by the experienced misfit, in 2008 two of the leading Dutch shipyards, together with a number of their subcontractors, started a large-scale program to improve the quality of interorganizational project practices. The program is part of a larger maritime innovation agenda which is supported by the Dutch ministry of economic affairs. The participants formulated their problems in their initial program report as follows:

"Specialization has led to fragmentation. Conflicting interests are a logical consequence and not infrequently impede collaboration. (...) But also assembling the necessary amount of knowledge, information and different disciplines, along with the fact that more than 70 per cent of the ship construction is delivered from outside the shipyard within a very tight schedule can sometimes cause great problems" (Integral Collaboration report, 2008).

According to the program director of the improvement program, problems encountered within IO shipbuilding projects due to misfit are for instance: information exchange difficulties between organizations involved in the project, subjective (sub-optimal) purchasing decisions in buyer-supplier relationships, and a failure to capitalize on available expertise in the pre-project phase. These problems result in higher communication, learning and production costs, and longer delivery times of shipbuilding projects and as such hamper the competitive position of the Dutch shipbuilding industry on the global shipbuilding market. The participants in the maritime improvement program in The Netherlands responded to the experienced problems by setting goals that should make the industry more competitive and decrease the misfit between the project practices and demands. Under the umbrella of the overall goal of improved collaboration, the program aims at, among others, reducing failure costs, increasing employee motivation, and improving knowledge storage and exchange. The participants in the program state that "an improvement in collaboration is needed in order to overcome the separation between the different phases in the construction process, between disciplines, and for joint risk management towards the customer."[5]

[5] Taken from the improvement program website, www.integraalsamenwerken.nl, 2012

However, the causes of the misfit between IO project practices and demands remain unclear. Recent work in the field of project management proposes that current project practices and misfits should be understood in the context of historical developments (e.g., Engwall, 2003). Still, research on collaboration in IO projects typically does not put observed contemporary practices and demands in a historical perspective, thus neglecting the possibility that project practices may be reproduced from one temporary interorganizational project to another (Windeler & Sydow, 2001), rather than reflecting adaptation to present circumstances and demands. If the historical dimension is left out of consideration, the implicit assumption is that IO project practices are only and immediately influenced by the current set of demands. This type of analysis neglects organizational inertia and path dependency (Sydow, Schreyögg, & Koch, 2009). Motivated by a strong belief in the importance of project history, scholars have recently called for the development of a history of projects (e.g., Jones & Khanna, 2006; Usdiken & Kieser, 2004). Responding to this call, we adopt a historical perspective in our examination of IO project practices in Dutch shipbuilding. A historical perspective, as propagated in the 'historic turn' in organization studies (Clark & Rowlinson, 2004), enables researchers to capture how project practices are over time influenced by changing forces in the environment, which is considered essential as environments, firm strategies, and organizations themselves change (Jones & Khanna, 2006). Also, it allows for the exploration of path-dependent aspects of project practices.

The main thrust of the present chapter is that the misfit between contemporary IO project practices and demands in the Dutch shipbuilding industry is in part caused by historical conditions. Project practices would follow external project demands in the absence of historically determined path dependency. Currently, some of the IO project practices are in a misfit with the contemporary IO project demands. For some practices we observe a lock-in, i.e., these practices have remained unaltered in spite of changes in project demands. Other practices did change, however, their adaptation to changing project demands followed a path-dependent process, in which possible alternatives that might have led to better fit were neglected.

2.2 Aim and outline

The goal of this chapter is to examine how the observed misfit between IO project practices and demands in contemporary Dutch shipbuilding projects are partly rooted in the past and consequently are the result of path dependencies and lock-ins. We answer the following

research question: *How did interorganizational project practices and demands in the Dutch shipbuilding industry develop between 1950 and 2010 and to what extent do these developments help us understand the current misfit between project practices and demands?* Our study on historical interorganizational collaboration aims to shed light on the historical roots of contemporary project practices. By doing so, it aids project managers and practitioners in better understanding the relationship between their project surroundings and their interior project management processes. Such an understanding will be supportive for managerial action since project management remains a difficult effort with many projects failing to meet their objectives within time and budget (White & Fortune, 2002). Answering to the call by Sydow et al. (2009), this chapter supplements the literature on path dependency literature by applying its insights to an interorganizational collaboration context. We show that although self-reinforcing mechanisms causing path dependency can be separated analytically, in the context of our study these mechanisms are strongly intertwined.

The chapter is structured as follows. In the theoretical section contingency theory is used to theorize on the notion of fit between IO project practices and demands. We complement the idea of fit, or, in our study, of misfit, with a historical view on lock-in effects and path dependency. In the empirical part of this chapter we first describe the major developments in project demands on interorganizational collaboration between shipyards and subcontractors in Dutch shipbuilding during the past half century. After that, a description of changes in IO project practices is presented in order to arrive at the main aim of this chapter: understanding if lock-in effects are at work and how they can partly explain the current misfit between IO practices and demands. For reasons of clarity, it should be noted that we do assume neither a fit nor a misfit in the Dutch shipbuilding industry in earlier times. Rather, the focus lies at understanding the current misfit. For that purpose, the developments in IO project demands and practices are described after which misfits due to path dependency and lock-in effects can be identified.

2.3 Theoretical background: Misfit, path dependency and lock-in

The concept of fit is central to structural contingency theory and has received much scholarly attention (Siggelkow, 2001; van de Ven, 1979). A basic assumption of structural contingency is that the internal organization, in order to be effective, must be aligned with its external environment (Drazin & van de Ven, 1985). Elements of the external environment include for example the level of competition and (technological) uncertainty (Eskerod, 1996; Jensen,

Johansson, & Löfström, 2006). The fit between internal organization and environment is usually described as external fit (Lawrence & Lorsch, 1967). The present study concentrates on the (mis)fit between interorganizational project practices and the environment in which the project is embedded. If these practices do not match with environmental demands, problematic misfit occurs, and for example efficiency suffers (Tushman & Nadler, 1978). Practices, including project practices, tend to have a taken-for-granted, institutionalized nature (Nelson & Winter, 1982), which somewhat contradicts the view of IO projects as "a panacea against strategic persistence and structural inertia" (Sydow, 2009, p. 123). With regard to the environment of IO projects, it is worth noting that it is rarely stable (Aldrich & Pfeffer, 1976; Duncan, 1972). This implies that over time an initial fit can become a misfit when environmental demands change and practices do not change accordingly (Gresov, 1989). Such fit-destroying environmental changes should induce project participants to change their practices to bring them in line again with the new environmental demands (Siggelkow, 2001). However, attempts of organizations to restructure practices to regain fit are not always effective (Mintzberg, 1978; Tushman & Romanelli, 1985) so that misfit remains.

In trying to explain misfit, scholars increasingly point to the role of history (e.g., Sydow et al., 2009). If we assume that history at least partially influences current misfit, the path-dependence concept appears a fruitful theoretical starting point (Schreyögg & Sydow, 2011). Applying only a contingency perspective – from which the concept of fit originates – would be of limited value. Contingency theory has been criticized for being inherently static and a-historical, failing to take into account the effects of past organizational behavior on current practices and (mis)fit (Donaldson, 1987; Shenhar & Dvir, 1996). Path dependency explicitly considers imprinting effects of the past on current behavior (Beckman & Burton, 2008). Path dependency is a broad concept indicating that prior organizational actions or behavior close down possible future paths of actions or behaviors (Jones & Khanna, 2006). Path dependency is related to – but not the same as – other theoretical mechanisms that connect the past and the present and which state that 'history matters' (Nooteboom, 1997), like institutional persistence and structural inertia.[6] Institutions for example have a tendency to evolve incrementally rather than radically, making it more likely that today's practices are very similar to yesterday's practices (Scott, 1995). Institutionalized practices consist of rules and resources that are produced and reproduced over time (Dille & Söderlund, 2011), shaping

[6] For a more detailed overview of how path dependency differs from other history-matters notions, see Vergne and Durand (2010, p. 742).

how organizational members perceive the environment and guiding organizational behavior (Phillips, Lawrence, & Hardy, 2000).

Although the concept of path dependency is quoted frequently, its meaning and logic often remain vague and ambiguous (Schreyögg, Sydow, & Holtmann, 2011). To deal with this issue, any theoretical or empirical contribution to the literature on path dependency should start with a proper definition of the concept (Vergne & Durand, 2010). In order to separate path dependency from other notions of history matters, we use a rather narrow definition, one that makes a distinction between the outcome of path dependency (so-called lock-ins) and the mechanism realizing that outcome (self-reinforcement).We define path dependency of practices as a process causing practices to be self-reinforcing, resulting in lock-in in the absence of exogenous shocks (based on Vergne & Durand, 2010). This definition is in line with Sydow et al. (2009), who claim that path dependency is first of all a process consisting of three developmental phases. In phase 1 – the Pre-formation phase – the range of practices from which participants can choose is broad. However, at so-called 'critical junctures' (Collier & Collier, 1991), an adopted practice triggers a self-reinforcing process which demarcates the start of phase 2, the Formation phase. In this phase a dominant pattern of practices is likely to emerge, making it increasingly difficult to reverse the initial pattern of practices. During the transition from phase 2 to phase 3 – the lock-in phase – options become even more constrained, leading to a situation in which practices become fixed and gain a deterministic character: lock-in occurs. A lock-in situation is characterized by a state of stability with low incentives for internal change (Vergne & Durand, 2010). In the context of interorganizational projects – because of their complexity and ambiguity – it seems better though to speak of quasi lock-in: a predominant set of practices which leaves some room for further development, but only in a direction commensurate with the self-reinforcement (Sydow et al., 2009). (Quasi) lock-in does not automatically result in inefficiency, but inherently over time practices are likely to become less efficient in the face of new, more efficient alternatives or changing internal or external demands (Sydow et al., 2009). To speak of quasi lock-in implies that lock-in is not absolute, but rather that one can distinguish between strong and weak lock-in situations.

In order to evaluate whether a misfit between IO project practices and demands really is the consequence of path dependency and subsequent lock-ins, a closer look at the mechanisms leading to lock-in is useful. Sydow et al. (2009) introduce four self-reinforcing mechanisms which are at the heart of path dependency: coordination effects, complementarity effects,

learning effects, and adaptive expectation effects. Each mechanism, or any combination of the four, can lead to the creation of a path which is increasingly irreversible and eventually leads to a (quasi) lock-in situation. The notion of coordination effects builds on the idea that it pays off to follow routines and adopt practices that are widely shared and used by others. Coordination effects are the consequence of shared rule-guided behaviors. The more actors adopt a specific set of practices, the more efficient interaction between them becomes. Behavior of actors can thus be anticipated and reactions can be considered in advance. Through these benefits of continuous replication, practices are likely to become fixed. Standardized and routine practices enhance efficient coordination when multiple organizations perform interdependent tasks under strong time pressure (Kadefors, 1995). The coordination effect shows resemblance with the network effect (Farrell & Klemperer, 2007).

With regard to complementarity effects, interaction between separate but interrelated practices creates synergy (Stieglitz & Heine, 2007). The benefits of repeatedly combining interrelated practices do not simply add up, but create an additional surplus. When practices are interconnected in a way that makes it unattractive to deviate from them, these practices are likely to become fixed (Leonard-Barton, 1995). Sydow (2009) for example shows that organizations in the German TV industry find it difficult to alter the type of programs they produce, because then they would not only have to change their routines but also their relations (which have a stable, permanent character). Another example of the interrelatedness of practices is addressed in the study of Faems et al. (2008) on the interdependence between contracts and trust in project governance. Coordination and complementarity effects often reinforce learning effects (Sydow et al., 2009).

The notion of learning effects revolves around the tendency of organizations to develop more efficient ways of working when practices are repeated. This makes it less appealing and more costly to switch to other ways of working despite the potential value of doing so. For example, organizations are less likely to turn to new partners if relationships with current partners are successful (Windeler & Sydow, 2001). Again, practices are likely to become fixed.

Finally, adaptive expectation effects can be the result of convergence towards expectations of others (Sydow et al., 2009). From an organizational perspective, while seeking legitimacy, organizational members are more willing to adopt certain practices when they expect others to follow these practices, too. These self-reinforcing adaptive expectations create self-fulfilling

prophecies in organizations. Szulanski (1996) for example shows that organizations, in trying to end up on the winners' side, copy practices because they expect others to do the same.

The theoretical arguments discussed above have been applied mainly to single organizations. In the present study they are applied in an interorganizational project context. When IO project practices do not fit the context in which they take place, project practices are less efficient than when practices and environmental demands do match. But even when organizations experience a mismatch between practices and demands, they may be unwilling or unable to change their practices because of self-reinforcing mechanisms. Following the theoretical arguments discussed above, organizations are less likely to change their project practices if a) practices have become routine among a set of actors and as such enhance the efficiency of collaboration (coordination effect), b) a set of practices is deeply intertwined, making it unattractive to deviate from any single established practice (complementarity effect), c) if – driven by efficiency reasons – the motivation to incrementally improve a given set of practices is higher than the motivation to look for new, radical alternatives (learning effect), leading to sub-optimalization, or d) if actors expect from one another that they collaborate according to well-established practices, and act on the basis of these expectations (adaptive expectation effect). Following this logic, path breaking will require an interruption of these mechanisms and the restoration of choice with regard to alternative practices. Altogether, from a historical perspective, path dependency and subsequent lock-ins may explain at least partially misfit between contemporary IO project practices and project demands.

2.4 Methods

2.4.1 Research design and setting

This chapter is an in-depth qualitative study that adopts an approach based on the 'Gioia template' (Corley & Gioia, 2004; Langley & Abdallah, 2011). Such an approach is considered useful for exploring relatively uncharted territory like the history of IO project practices in Dutch shipbuilding. A virtue of this type of research is that it explicitly takes into account the possibility that current practices are rooted in history, i.e., are 'institutionalized' to the extent that their use is rarely questioned. This approach is useful because of its focus on "understanding the changes people are both instigating and dealing with, and how those meanings evolve" (Langley & Abdallah, 2011, p. 213).

Following Yin (2003) we choose the Dutch shipbuilding industry as a 'revelatory' case that offers high potential for gaining a better understanding of the understudied phenomenon of project history. The Dutch shipbuilding industry is deemed revelatory because of its long tradition in interorganizational project-based production, the high technical and organizational complexity of their projects and the important contextual changes which took place over time in this industry. Interorganizational collaboration in shipbuilding is complex due to, among others, multi-partner involvement and pressures of time and place. We focus on the period 1950 – 2010 because during this period collaboration demands have changed considerably under the influence of increasing competitive pressure from low-cost countries. In addition, focusing on earlier periods would not allow for the use of oral resources. We limit our study of the Dutch shipbuilding industry to the subsectors involved in the improvement program: offshore, navy, ocean shipping, dredging and maritime subcontractors, and excluded inland shipping, fishing, harbors and aquatic sport.

2.4.2. Data collection and analysis

Our data consists of interviews with active and retired employees of shipyards and their subcontractors. The importance of oral sources to gain a valid understanding of practices is considerable since practices are rarely written down. During the period April – July 2010 fifteen interviews were conducted with respondents who were at that moment actively involved in the Dutch shipbuilding industry and who participated in the industry improvement program. These interviews serve as the primary source for providing the picture of current IO project practices in Dutch shipbuilding. During the period July – October 2011 and August – September 2012 nine interviews were conducted with respondents formerly employed in the industry, and one with a maritime researcher. Together, these twenty-five interviews with employees and former employees of shipyards and their subcontractors provide information on historical and contemporary IO project practices and demands. They also provide understanding of whether or not IO project practices and demands have changed over time and, in case of change, why and how these changes have taken place. For the interviews with retired shipbuilders we relied on purposeful sampling followed by a snowball technique, asking each informant for his recommendations as to who could best explicate the processes of interest (cf. Corley & Gioia, 2004). Interviews lasted on average 60 minutes and were all audio-recorded and transcribed verbatim. Respondents were or had been employed by both shipyards and subcontracting firms. All interviews were semi-structured and relied on an interview protocol focusing on key events and issues within the Dutch shipbuilding industry.

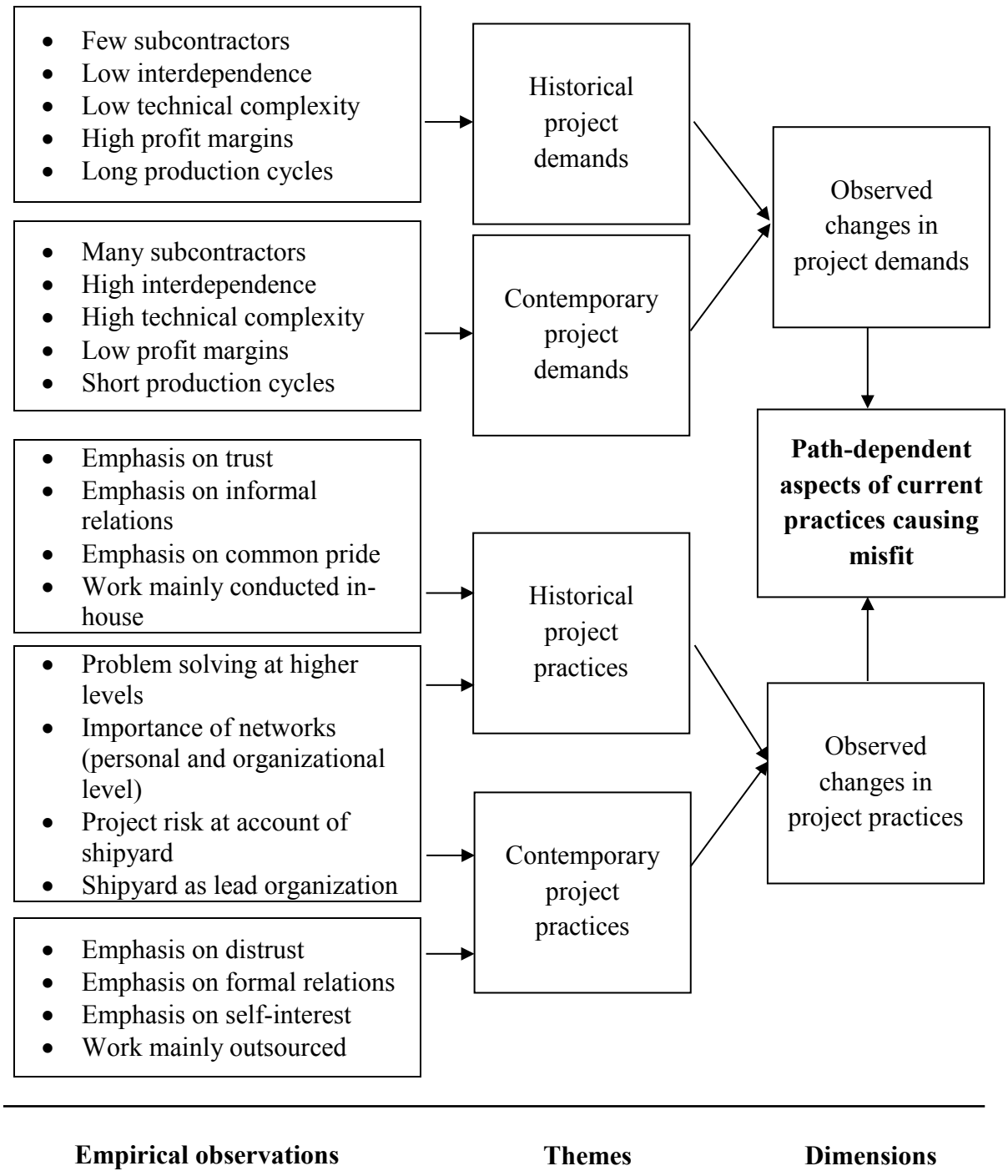
To minimize respondent bias, during the interviews, we did not impose constructs or theories on respondents as some sort of preferred explanation for understanding their experiences (cf. Gioia, Corley, & Hamilton, 2012). Recall bias was at a minimum since most of the retired respondents were still active in some way or another in the current Dutch shipbuilding industry, for example through branch organizations or charity.

We analyze the data using constant comparison (Glaser & Strauss, 1967), which means that the analyzing process begins during and also influences the next stages of data collection. As mentioned before, we follow Corley and Gioia (2004) in their approach of coding. Sporadic differences in coding between the researchers were resolved through discussion. During the execution of the research, we identified initial constructs in the data from our interviews and grouped them together into empirical observations. From this open coding we started to construct second-order themes between these concepts which were historical and contemporary IO project practices and demands. After this categorization into our objects under study, we were able, firstly, to describe how IO project demands in the Dutch shipbuilding have developed in the time period 1950 – 2010. And secondly, we were able to take stock of the practices in Dutch shipbuilding that either changed or remained the same over time. In the next step we identified IO project practices as path-dependent when, firstly, they were in a misfit with the current set of IO project demands and, secondly, we were able to identify (combinations of) the four self-reinforcing mechanisms as described in the theoretical section. The focus on misfitted practices is driven by the notion that inefficiency is a feature of path dependency (Sydow et al., 2009). Misfit was identified based on the experienced problems and the goals of the maritime improvement program. We searched for the self-reinforcing mechanisms as antecedents of lock-in.

An overview of our central findings can be found in the data structure (Figure 2.1), in which the various identified constructs are linked to each other (cf. Corley & Gioia, 2004). The process of analysis was iterative in nature until we had a clear understanding of the relationships in our data and further interviews could not provide new insights.

FIGURE 2.1

Data structure



2.5 Findings

In order to describe the developments in IO project practices and demands in the Dutch shipbuilding industry between 1950 and 2010, we first describe changes in both IO project practices and demands by putting their historical and contemporary accounts next to each other (see Tables 2.1 and 2.2). These accounts are based on interviews with respondents both actively and formerly employed in the industry. Based on these accounts we discuss which of the current project practices are in misfit with the current project demands. Next, we discuss the path-dependent aspects of these IO project practices, making use of quotes from both the retired and still active shipbuilders. In Appendix A we present evidence supporting our interpretations of project practices and demands.

2.5.1 Development of IO project demands in the Dutch shipbuilding industry

In the 1950s and 1960s, the economy of the Netherlands was gradually improving. After WWII, there was a recovery period during which there were plenty of orders for shipyards and high profit margins. The volume and number of ships constructed increased but the technical development lagged behind relative to international standards. One of the retired shipbuilders stated that this was illustrated by the relatively late transition from the traditional riveting of steel plates (a construction method at which two workers hammer both ends of a steel pin until it is rounded) to the general use of welding (the process of amalgamating two steel plates into one by melting the two pieces and adding a filler material). Firms other than the shipyards taking part in projects mostly acted as suppliers rather than co-makers. In other words, they supplied pre-specified parts or components but they did not perform much work on the ship itself. Consequently, the interdependence between firms was relatively low. However, the present-day situation is characterized by a strong increase in the outsourcing of work to specialized subcontractors due to the fact that vessels have become technologically more complex and knowledge intensive. This results in high interdependence between organizations during the production process. As the retired shipbuilders stated, this was not the case around the period 1950–1970. The type of vessels built at that time had relatively low levels of technical complexity. As a result, there was hardly a need for the shipyard to in-source technical know-how. The ethos of the industry revolved around building ships rather than manufacturing capital goods. This was mainly attributed to market conditions in which the Dutch shipbuilding industry produced relatively simple, large vessels like tankers and bulk carriers. The production time of ships was relatively long, resulting in low time pressure.

Nowadays, shipbuilding is characterized by a modern industrial orientation, i.e. standardization and fine-tuning of the production cycle which is illustrated by the adoption of section-wise construction and the use of computer-aided design. This change in orientation started roughly from the 1980s onwards. Time pressure on project completion increased due to the shortening of production cycles and profit margins decreased under the influence of global competition, which was spurred by the rise of Asian economies like Japan back then followed by South Korea and China today. This trend forced the Dutch shipbuilding industry to re-focus on niche markets and direct its efforts to specialization and innovation. In comparison to European competitors, the Dutch shipbuilding industry has been able to maintain its position. However, as described in a British research report, the position of the Dutch shipbuilding industry remained precarious:

"The Netherlands nearly lost its shipbuilding industry in the late 1980s but appears to have fully recovered in the 1990s, though it saw a sharp drop-off in sales in 2003. The Dutch market was in 2005 roughly where it was in the late 1970s." (RAND Corporation, 2005)

The shipbuilding industry was and is highly sensitive to cyclical economic fluctuations due to its dependence for project orders on shipping companies and ship owners. Both active and retired shipbuilders indicated that this is the case. This market condition does not seem to have changed over the years.

Summarizing, we observe a coherent set of IO project demands which have undergone major changes over the past few decades. Both organizational and technological complexity of IO projects have increased because of an increase in the number of project partners involved and the interdependency among them, technological developments and more intense time pressure on the production of vessels. Because of these factors, which are amplified by a decrease in profit margins and a continuous sensitivity of the sector to economic fluctuations, the current Dutch shipbuilding industry can be characterized as a versatile and dynamic environment.

TABLE 2.1

Overview of IO project demands in the Dutch shipbuilding industry

Historical demands	Contemporary demands
Few partners involved in a project	Many partners involved in a project
Low interdependence (subcontractors only supplying components)	High interdependence (subcontractors installing components on board)
Low technical complexity of vessels	High technical complexity of vessels
Low time pressure, long production cycles	High time pressure, short production cycles
High profit margins	Low profit margins
Sensitivity to economic fluctuations	Sensitivity to economic fluctuations

2.5.2 Development of IO project practices in the Dutch shipbuilding industry

In the 1960s and 1970s shipyards used to perform most of the work in-house. As a result, there was less urgency to coordinate and monitor other firms. Shipyards used to employ everyone: they had their own painters, their own scaffold builders, their own carpenters, and so on. They outsourced very little. Over time, the outsourcing of project work to subcontractors has increased significantly, driven by the need for cost reduction caused by the project demand of price competition on the global shipbuilding market. Outsourcing was a response to the demands of shorter production cycles, increased time pressure, greater technical complexity, while it also provided shipyards with greater flexibility. However, while outsourcing more and more work, the shipyards have clung to their orchestrating role in the process. The shipyards have always been and still are the central actors in a project. They coordinate and monitor the activities of subcontractors, communicate exclusively with the end customer where formal issues are concerned, and also bear most of the risk on the project. It is this unbalanced risk-taking that is the major source of problems between shipyards and subcontractors, as put by one of the retired shipbuilders:

"When the yard's project manager and the subcontractor's project manager share the responsibility, you can get improvement. But that discussion never came to a good end. Nobody wanted to make concessions. Then it stops. As long as responsibility resides with one party, that party will take the decisions, because he is responsible for profit and loss." (Retired shipbuilder)

Early in the second half of the twentieth century, IO project practices in the Dutch shipbuilding industry were characterized by flexible contract application and by coordinating relations primarily based on trust. People from the shipyards and subcontractors saw each other in the church on Sunday, so trust developed there. The contract was a document, you needed to have it, but it was only for emergencies. They did not use it in every-day practice. However, this changed notably over time because, for example, having more subcontractors impeded the development of personal relationships with everyone. Nowadays, contracts are more detailed and broader in scope. Shipyards and subcontractors nowadays tend to write extensive and elaborated contracts and apply them in a rigid manner. This has led to lower trust levels between shipyards and subcontractors.

Another finding is the decay of the common pride that formerly characterized the Dutch shipbuilding industry. Some of the contemporary actors expressed enduring pride in their work which is mainly displayed in an attitude in which the overall project success takes pride of place. Others however emphasize self-interest, either financial or otherwise, even if at the expense of the project. Pursuing one's self-interest is illustrated by the following quote:

"People are more and more looking up their own alley. This part is finished within the allocated hours so I am done with it. If I have to step it up to make it more efficient somewhere else, I will put in more hours and I am evaluated by that so I rather don't." (Technical manager Shipyard)

Notwithstanding the practice of prioritizing one's self-interest, there is also still emphasis on informal personal and organizational networks in which participants involved in the IO project enhance their communications, direct their efforts and observe their attitudes. This IO project practice of operating through informal personal and organizational networks does not seem to have changed dramatically over time. In current shipbuilding projects that operate in a flexible and informal way, respondents indicate that the pleasant and successful collaboration is a consequence of the long-lasting relationships between yards and suppliers. However, this is no longer a widespread practice in the industry.

Summarizing, we observe that some practices have changed during the past five decades whereas other practices have remained relatively stable. A major change is that shipyards nowadays outsource significantly more of the work to subcontractors. In addition, IO project practices have shifted from a more informal way of organizing work and coordinating relations to a more formal manner of collaboration, with a stronger emphasis on contracts. Examples of practices that have remained more or less the same over the past decades are the central role of the shipyard, the skewed financial responsibility for projects, and the importance of informal networks.

TABLE 2.2

Overview of IO project practices in the Dutch shipbuilding industry

Historical practices	Contemporary practices
Shipyard conducts most of the work in-house (work distribution shipyard – subcontractor: 70-30)	Shipyard outsources much of the work (work distribution shipyard – subcontractor: 30-70)
Shipyard acting as lead organization	Shipyard acting as lead organization
No risk sharing, financial responsibility at the shipyard	No risk sharing, financial responsibility at the shipyard
Emphasizing informal contracting	Emphasizing formal contracting
Trust-based coordination	Less trust-based coordination
Emphasizing common pride	Emphasizing (financial) self-interest by some participants, lasting pride by others
Problem solving at higher (managerial) levels	Problem solving at higher (managerial) levels
Importance of networks (personal and organizational level)	Importance of networks (personal and organizational level)

2.5.3 Contemporary IO project practices and misfit

Although some IO project practices have changed over the years, these changes did not always increase the fit with the changing demands set by the task environment. Furthermore, there are also practices that remained the same over the period of 1950–2010, either causing a misfit or allowing an already existing misfit to continue. Based on the practices considered appropriate by the project participants in the improvement program mentioned earlier in this chapter, we consider four contemporary practices to be at a misfit with the current set of IO project demands. First, the complete financial responsibility at the account of the shipyard, which remained the same over time, does not fit with the current project demands of higher interdependence between project participants, the consequent need for increased knowledge sharing, and lower profit margins in the Dutch shipbuilding industry. The current set of IO project demands calls for a more shared risk distribution, or, in the words of one of the respondents in this study:

"The more product complexity increases, and the available time decreases, the more you have to move towards collaboration in which risks are shared. The same goes for financial risks. That is a learning process for both parties. It also means there has to be trust, you let them look behind the scenes, and people have to dare. And I have to admit it is laborious." (Commercial director Shipyard)

Second, the shipyard's role as lead organization in the IO project, which remained the same over time, does not fit with the increased number of partners involved in a project and the higher technical complexity of vessels. These contemporary demands make it difficult for one single firm to coordinate the entire project and bring together all the required technical know-how. This is formulated by the program director of the maritime improvement program as follows:

"We used to know that a guy was pulling cables on a project but we didn't know exactly how he was doing besides his remark: 'it is going okay'. When you have more specific information on that, you can take better decisions." (Program director Integrated Partnership)

Third, the stronger emphasis on self-interest, which increased over time at the expense of the common pride in shipbuilding projects, is at a misfit with the increased competitive pressure from Asia, in combination with the modern industrial orientation on producing turn-key maritime products appropriate for the complex products in which the Dutch shipbuilding

industry now specializes. These demands necessitate a holistic project-oriented attitude of all partners involved in order to achieve the goal of a stronger competitive position of the Dutch shipbuilding industry. Shipbuilding projects can benefit from participants that align their self-interest more with the broader interorganizational project than their organization-wide interest. One of the respondents stated:

"I used to check all the drawings but eventually I thought: this is not my job, I don't get paid for this. So now we use more materials, it increases the cost price" (Contract manager Subcontractor)

Finally, the stronger reliance on formal contracting is assumed to be at a misfit with the demands of higher time pressure and shorter production cycles in shipbuilding projects. More formalized contracting makes it difficult to quickly react to changing project conditions and efficiently deal with the increased time pressure and shorter production cycles. One of the retired employees in our study formulated the problematic nature of this practice as follows:

"Currently, I see how lawyers get bogged down in contracts, how they are nitpicking each other. That is nothing but distraction from the real goal: to build a ship together." (Retired shipbuilder)

The above shows that some current IO project practices in the Dutch shipbuilding industry do not fit well with current IO project demands. In the following we try to show that this misfit is at least partially the result from path dependency by zooming in on the self-reinforcing mechanisms explained in the theoretical section of this chapter.

2.5.4 Self-reinforcing mechanisms in IO project practices

We will assume path dependency only to be probable when there is a misfit between current IO project practices and project demands. This is in line with the assumption that path dependency inherently leads to inefficiency, or sub-optimalization. In the preceding text we have identified a current misfit between IO project demands and the following IO project practices: a) the shipyard bears the major risks and full responsibility towards the end customer for delivering the vessel on time and according to specifications; b) the shipyard acts as the lead organization; c) shipyards and subcontractors pursue predominantly their own (financial) interests; and d) shipyards and subcontractors contract in a formal, rigid way. While the former two practices have remained stable over the past 60 years, the latter two have changed substantially during this period.

The criterion we use to identify practices as actually being path-dependent is whether one of the self-reinforcing mechanisms, or a combination of these mechanisms, has plausibly influenced the development or stagnation of project practices. We distinguish between two possibilities: a) we observe a change in project practices over time which is not in line with the evolution of project demands, or b) we see stagnation of a project practice in spite of a lack of fit with historical and/or contemporary project demands. In the first instance we see the development to the situation of lock-in, in the second case the lock-in was already present.

If we consider the first ineffective practice (shipyard bearing full risk and responsibility), our findings indicate that project demands have changed over time while this practice has not changed accordingly. In a situation where subcontractors represent about 70% of the total costs of producing a vessel, it seems justified for subcontractors to bear at least part of the risk and responsibility. However, the current practice can be understood from a path dependency point of view. Because the shipyard has always carried full financial responsibility it has learned to take on that role efficiently. If subcontractors would take a share in that responsibility, they would have to develop new skills (e.g., communication and negotiation with the end customer, monitoring the actions and efforts of other subcontractors, skills related to funding the project and dealing with financial risks) in order to carry out that new role:

"In the pricing of the project you have to take into account that things can go wrong. […] The subcontractor is not used to that; yeah, their own small responsibility but never as part of the bigger process." (Retired shipbuilder)

Shipyards and subcontractors have learned to play their own specific role efficiently, and changing these roles would require non-trivial adaptation problems. This suggests that both coordination and learning effects are at work in causing this practice to be persistent over time. Because the practice has remained stable over the past 60 years, reinforcement has continued over a long time period, resulting in a strong lock-in which is very difficult to break.

Another, related, IO project practice that has not changed over time is the shipyard acting as the lead organization. This practice can be interpreted as reinforcing due to coordination and learning effects on the one hand and adaptive expectation effects on the other hand. The coordination and learning effect reside in the division of roles in which the shipyard acts as the leading organization, a constellation of roles that is perceived by both shipyards and

subcontractors as normal and efficient. Because the shipyard is the leading party during every project, they have mastered a certain efficiency and standardization regarding the coordination of collaboration. Similarly, subcontractors have become proficient in their role of being responsible for their specific contribution. The adaptive expectation effect lies in the persistent division of roles due to which project participants expect this same division of roles to occur in new projects. A subcontractor participating in a new project would automatically assume the shipyard to be in the lead, and they would expect the shipyard and other subcontractors to have the same assumption. Again – similar to the practice of the shipyard bearing full risk and responsibility – this practice has reinforced itself over a long time period and has become strongly institutionalized:

"The discussion of the subcontractors becoming more central started somewhere in '85. Whenever the subject was discussed everyone backed out at the end of the day and said: No, let's stick to the old way." (Retired shipbuilder)

The combination of the shipyard bearing all the risk and financial responsibility and acting as lead organization constitutes a complementarity effect: the interrelatedness of these practices makes it problematic to deviate from either one. For parties that bear financial risk, it seems logical to take on a leading role, as the retired shipbuilders pointed out. A subcontractor may feel no urgency to become more central if he has no financial responsibility, and may be reluctant to take responsibility if not given the central power and authority to manage the collaboration process. Due to this complementarity effect, this set of practices has become fixed. While each practice on its own is self-reinforcing, the interrelatedness of the practices strengthens these self-reinforcing effects, resulting in a very strong lock-in.

Next we discuss the two practices that have changed over time and which we consider ineffective given the current project demands. The current trend that both shipyards and subcontractors mainly pursue their own interests intuitively conflicts with the current demand stemming from the organizations' increasing mutual dependency. Comparing this present-day situation with the situation a few decades ago, it appears that in the old situation the range of options was broader than in the current situation. While earlier shipyards and subcontractors could choose between pursuing self-interest on the one hand and working for a common cause on the other hand, the current situation seems to predispose them to neglect the greater cause and pursue first and foremost their (financial) self-interest. Our results indicate that this process is at least partially triggered by adaptive expectations. Because of the involvement of

multiple, legally independent organizations – that implicitly or explicitly have separate and conflicting financial interests – the common expectation has become that organizations will give priority to protecting these interests. When organizations expect their partners to act in a self-interest seeking manner, they are more likely to display the same behavior, which will be observed by the others, thus creating a self-fulfilling prophecy. This vicious circle leads to a situation where behaving opportunistically is considered the only appropriate course of action, so that lock-in occurs:

"A shipyard that accepts a price for a vessel, that's often under pressure, will try to get that money back from the subcontractors. Well, that's contrary to the idea of co-makership, which is the motto. That was a hundred years ago a problem, it was fifty years ago a problem and it's still a problem." (Retired shipbuilder)

"That guy [shipyard employee] has been molded that way over twenty, thirty years. You cannot change him anymore, that's a non-starter. He has been trained to exploit subcontractors, and that is what he will be doing for the rest of his career." (Contract manager Subcontractor)

Related to this IO project practice is the practice of formal contracting. While earlier interaction between shipyards and subcontractors was of a more informal nature, the current situation is characterized by more formal ways of interaction, including formal contracting. Our interviews indicate that this practice has co-evolved with the practice of pursuing self-interest. If organizations expect others to behave opportunistically, they will try to safeguard their own interests. This can be accomplished by writing extensive, detailed contracts in which roles and responsibilities of each partner are made explicit. The interrelatedness of these two practices suggests that complementarity effects play a role in reinforcing a process in which options have narrowed down, eventually leading to a lock-in situation. This lock-in situation is characterized by organizations pursuing mainly self-interests, and relying on formal contracting to safeguard against opportunistic partner behavior.

"Practice has changed from having a common goal towards crafting contracts with hidden meanings which I can use to my own advantage." (Retired shipbuilder)

In sum, our results suggest that the current misfitted practices can at least partially be explained by path-dependent processes. Shipyards bear full risk and responsibility and act as lead organization because over time they have learned to perform this task efficiently, which

fosters coordination of and communication between shipyards and subcontractors during the process of building complex vessels. Shifting responsibility towards subcontractors would require substantial investments to master new, unfamiliar skills both on the account of the shipyards and the subcontractors. Shipyards and subcontractors pursue self-interest and rely on formal contracting because they believe that the others follow this strategy as well, creating a vicious circle in which these practices reinforce one another to the point that other options are considered inefficient.

2.6 Conclusion and discussion

The starting point of this chapter is the acknowledgement by industry actors in Dutch shipbuilding that contemporary IO project practices do not fit contemporary IO project demands. In this chapter we have explored path-dependent explanations for this misfit. Focusing on the practices that do not fit contemporary demands, we have identified continuity in some practices and change in others. Both persistent and changed practices seem to be influenced by combinations of self-reinforcing mechanisms. The practices of shipyards being the lead organizations and bearing most of the risks have remained stable over time because of coordination, learning, and complementarity effects. The changed practices of pursuing mainly self-interests and formal contracting seem to be the result of adaptive expectations and complementarity effects. All in all, our analysis suggests that the misfit has at least partially been shaped by historical developments.

To understand the misfit between demands and practices in Dutch shipbuilding projects, we complemented contingency theory with the path dependency perspective to avoid the static and a-historical stance of the former theory. In doing so, we advance the field in several ways. First, we empirically identify theoretically proposed mechanisms (Sydow et al., 2009) which trigger path dependency. Most empirical research on path dependency tends to examine path dependency in the sense of 'history matters' only, without entering into details on self-reinforcing mechanisms (Vergne & Durand, 2010). Our findings suggest that indeed the proposed mechanisms play a significant role in explaining lock-in situations and subsequent misfit in an IO project context. In addition, we suggest a refinement of the proposed mechanisms by taking into account that the mechanisms operate not in isolation but in an interrelated manner. It seems precisely to be this interrelatedness between the mechanisms of path dependency that makes misfit so difficult to remedy in the Dutch shipbuilding industry. Thus, similar to interrelated practices, interrelated mechanisms form a configuration which

creates complementarity effects. Second, our study demonstrates that path dependency can lead to incremental or creeping change. As we have shown, some IO project practices have changed over time in a direction counter to what one would expect given the contemporary environmental demands. During this process, the availability of alternative practices has decreased, ultimately leading to a lock-in situation. This process – which we label path-dependent adaptation – is counter to contingency theory's assumption that organizations change their practices on short notice to bring them in line with changing environmental demands. So while contingency theory assumes organizations to change practices to regain fit, path dependency helps explain why organizations sometimes change their practices in the 'wrong' direction, thereby creating or sustaining misfit. Third, we extend path dependency literature by applying its insights to the context of IO projects. Most research on path dependency pertains to organizations rather than goal-directed networks of organizations, but we show that insights on path dependency can be generalized to this context as well. Our fourth and final contribution is a critical note on path dependency models that describe path dependency as a three-stage process (e.g., Sydow et al., 2009, p. 692). Such models may be less suited to explain situations of early lock-ins. Some IO project practices in Dutch shipbuilding have remained unaltered over time, suggesting that the available range of alternative practices has been limited since the beginning. This seems to call into question the idea of 'critical junctures', the moments at which practices become subject to self-reinforcing mechanisms. Though these models aid in explaining why these practices have not changed over time, they fail to explain how early lock-in situations are reached. Explanations other than path dependency may be needed here.

2.7 Implications and directions for future research

Based on our findings we suggest two practical implications for project managers, in specific change agents (e.g., Seo & Creed, 2002), seeking to change practices. First, they should be well aware of historical influences on contemporary practices. Historical influences hamper their ability to break away from these practices because they follow a more or less pre-determined path. To change these practices would require path breaking. The idea of path breaking however is somewhat self-contradictory since path dependency is a process in which organizations or industries face difficulties in changing their practices successfully. A minimum condition would be the development of alternative practices, and the interruption of the discussed self-reinforcing mechanisms. An approach to deliberately break paths might be critical reflection on taken-for-granted practices, for example via assumption surfacing

(Kettinger, Teng, & Guha, 1997). On top of that change agents should consider the development of superior alternative practices (cf. Arthur, 1994). Second, change agents should be aware of the interrelatedness of practices as well as of the path dependency mechanisms underlying their persistence. Interrelatedness of practices implies that one cannot change one practice without influencing the other. To successfully change practices then requires a configurational or holistic approach (e.g., Clarke, 1999). Such an approach would consider the complexity and interrelatedness of practices and develop initiatives aimed at changing sets of practices rather than single ones. Interrelatedness of path dependency mechanisms implies that multiple causes for a lack of adaptation to project demands must be addressed simultaneously. For instance, to change the practice of the shipyard bearing all the risk in a project, the suppliers involved should learn to master this role, but the mutual tacit assumptions concerning the roles of shipyard and suppliers should also be addressed. The difficulty to achieve all these changes simultaneously may well explain why improvement initiatives like the one mentioned in the introduction to this chapter have a high risk of failure.

There are some limitations to our study which suggest opportunities for future research. The most salient limitation is of a methodological nature. In trying to discover path-dependent explanations for the current misfit, we have relied on subjective, oral sources. This method makes it difficult to objectively establish if the current misfit is indeed the result of path dependency, and to ascertain which situations qualify as lock-ins. In response to this issue experimental studies as proposed by Vergne and Durand (2010) could be performed, but these would in turn be limited in their ability to incorporate historical aspects, especially at the industry level, like in the shipbuilding sector that formed the context of our study. A related issue concerns our single-method approach, which limits the possibility to triangulate data. The use of documents and archival data could provide additional insights. As IO project practices, especially informal ones, are rarely written down such an archival approach in our view should be combined with oral history. Another limitation concerns respondents' recall bias, to the extent that they may better recall positive events than negative ones, creating an inaccurate picture of historical practices and demands and their development. However, respondents did not give the impression to believe that everything was better in the old days, and in some cases concluded that the current problems are no different from the problems 60 years ago. In addition, many of the retired shipbuilders we interviewed are still active in industry associations, enabling them to reflect on both historical and contemporary practices and demands. Considering these various limitations, future research could benefit from

developing more objective measures of the self-reinforcing mechanisms, and from applying a multi-method approach combining the use of documents, archives, and statistical analysis.

3. Not so temporary after all: An empirical exploration of flexibility behaviors in a temporary organization and the influence of time

3.1 Introduction

Interorganizational temporary organizations (TOs) are typically assumed to offer flexibility (Bechky, 2006; Whitley, 2006) as they bring together, on a temporary basis, a variety of skilled organizations and individuals to realize complex products and services (Jones & Lichtenstein, 2008). The temporary mobilization of multiple expert organizations offers organizations flexibility *across* TOs: when new TOs are initiated, lead organizations can select partner organizations who they perceive to be best suited to perform the task at hand (Hobday, 2000), and these partner organizations can adapt their involvement in different TOs to their capacities. Yet, we know surprisingly little of flexibility *within* TOs, defined in this chapter as the extent to which TO participants adjust their operational plans and behaviors in response to requests from other TO participants (cf. Heide & Miner, 1992; Lusch & Brown, 1996). The flexibility of lead organizations to configure TOs to their evolving needs over time (i.e., strategic flexibility) does not necessarily result in flexible behavior within TOs (i.e., operational flexibility). This flexibility at the operational level is essential to assure that the end product is finished on time and in accordance with customer requirements (Kreiner, 1995; Sydow & Staber, 2002), and is considered an important interorganizational resource (Young, Sapienza, & Baumer, 2003). TO participants are called upon to be flexible when facing unpredictable environments, incomplete plans, and unforeseen contingencies (Badenfelt, 2011; Kadefors, 1995; Pich, Loch, & de Meyer, 2002). But flexibility within TOs cannot be taken for granted because it typically comes with costs and lower operational efficiency, while it can also lead to stress among participants (Fredericks, 2005; Golden & Powell, 2000; Ivens, 2005; Olsson, 2006). Therefore, TO participants need to find a balance between on the one hand protecting their own interests, and on the other hand accommodating the needs of others as well as the needs of the TO as a whole. How TO participants balance these (maybe conflicting) interests is likely to be influenced by what is considered the central and unique characteristic of TOs: their limited duration, or temporariness (Kenis et al., 2009). On the one hand, the limited duration of TOs can induce participants to display 'end-game behavior' (Selten & Stoecker, 1986), which involves non-cooperative behavior like for example inflexibility. On the other hand, because of TOs' impending termination, participants can become immersed in the task at hand and behave flexibly in order to accomplish that task

(Saunders & Ahuja, 2006). The effect of time and time limits on TO participants' behavior thus remains ambiguous (Bakker, 2010).

A detailed analysis of flexibility and time within temporary organizations is currently lacking (Bakker, 2010; Ivens, 2005). The majority of flexibility research examines flexibility in an intraorganizational context like manufacturing (e.g., Sethi & Sethi, 1990) or on a strategic level (e.g., Sanchez, 2007). Furthermore, flexibility is often one variable among many others but not the focal concept (e.g., Noordewier, John, & Nevin, 1990). The concept of time is generally considered a central element of organizational life (Ancona et al., 2001; Lee & Liebenau, 1999). But the influence of time and TOs' limited duration on TO processes and outcomes so far received only scant attention and the studies that do touch upon this subject are predominantly of a conceptual nature (Bakker, 2010).[7]

Recently scholars have called for more elaborate research on flexibility and time in interorganizational collaboration (Bakker, 2010; Vlaar, van den Bosch, & Volberda, 2007). We aim to open the black box of flexibility within TOs, with a specific focus on the role of time (cf. Ancona et al., 2001). Digging deeper into the concept of flexibility within TOs, several questions arise. What types of flexibility requests do TO participants make? How do TO participants respond to these requests, and what are the drivers behind these responses? In addition, taking into account the role of time, do requests and responses change over the course of a TO? And specifically, what is the influence of a TO's ex ante defined ending point on the flexibility displayed by its participants? We try to answer these questions via an empirical exploration of a shipbuilding project, in which functionally interdependent organizations collaborate on a temporary basis to produce a technologically and organizationally complex vessel. Given our goal of developing a deeper understanding of how time and flexibility play out within such a TO, we adopt a qualitative single-case study design (Yin, 2003). This allows for an in-depth analysis of requests, responses, drivers of responses, and the role of time through a combination of analyses of interviews and observations. From a theoretical point of view, this chapter sheds light on the influence of time on collaboration processes within TOs. Such a 'temporal lens' provides an important framework for explaining and understanding (inter)organizational behavior (Ancona et al., 2001). From a practical point

[7] In his review of literature on temporary organizational forms in the period 1964-2008, Bakker (2010) found ten studies focusing on the effect of TOs' ex ante defined termination on TO processes and outcomes, of which eight were conceptual.

of view, this chapter provides TO participants with insights into how to optimize operational flexibility. Flexibility optimalization in turn can increase trust and commitment among participants (Ivens, 2005) as well as TO performance (Walker & Shen, 2002). Our findings show that operational flexibility is a multi-dimensional construct and influenced by various time orientations of TO participants, who can simultaneously focus on the past, present, and future. This in turn suggests a reconsideration of the importance of TOs' ex ante defined termination point, generally regarded as their central and unique attribute.

The outline of the remainder of the chapter is as follows. First we discuss the literature on flexibility and time in the context of TOs to indicate what we know and what remains to be explored concerning the subject. As we aim to contribute to theory building, the theoretical section provides the necessary background of our study rather than that it leads to a set of testable hypotheses. Next, we describe the methodological approach, followed by a description of our empirical findings. Finally, we discuss theoretical and practical implications and formulate conclusions.

3.2 Theoretical background

3.2.1 Temporary organizations and flexibility

The increasing prevalence of TOs has been accompanied by an exponentially growing body of research on TOs over the past few decades (Bakker, 2010), of which some is directed to the flexibility of TOs. Generally TOs are considered to offer flexibility in the sense that they temporarily mobilize the resources of various external organizations and disband once the product or service is delivered (DeFillippi & Arthur, 1998; Maurer, 2010). Lead organizations create and recreate new organizational structures around the demands of each TO, and because the TO is a temporary organizational form, over time organizing through TOs is inherently flexible and reconfigurable (Bechky, 2006; Hobday, 2000). This refers to strategic flexibility at the level of the sector or parent organizations. However, it does not address flexibility at the operational level within a specific TO. Operational flexibility can be considered a dimension of the quality of interorganizational collaboration (Heide & Miner, 1992). It is important for dealing with incomplete plans and unforeseen contingencies, and ultimately for realizing the objectives of individual TOs (Sydow & Staber, 2002). Within TOs, the involvement of multiple organizations and their interdependence pose considerable challenges for the coordination of tasks and relations (Jones et al., 1997; Knoben & Gössling, 2009). In trying to overcome these challenges, organizations can rely on several coordination

mechanisms such as contracts, planning instruments, and procedures (Dekker, 2004; Grandori, 1997; Vlaar et al., 2007). But due to the instability and unpredictability of the environments in which some TOs operate (Kadefors, 1995), future aspects of work can never be fully predicted or described (Badenfelt, 2011).

Furthermore, even if initial plans were complete, unforeseen contingencies (like for example changing user demands) could render these plans unfeasible (Pich et al., 2002). Consequently, within TOs, participants are often called upon to be flexible at an operational level. Yet, flexibility cannot be taken for granted because it has its downsides as well (Fredericks, 2005). Responding to a partner's request for flexibility can negatively influence own operational efficiency or effectiveness (Ivens, 2005; Olsson, 2006). Also, flexibility can lead to stress among participants and a lack of focus (Golden & Powell, 2000). Flexibility within TOs thus requires balancing own interests and the interests of others and of the TO as a whole. [8]

Because of the scarcity of literature on flexibility within TOs, in defining flexibility at an operational level we have to rely on other sources. Marketing literature commonly portrays flexibility as an interorganizational norm serving as a general protection mechanism against opportunistic behavior (Heide & John, 1992), and defines it as the degree to which partners adjust their own behavior to accommodate the needs of others (Heide & Miner, 1992). For the purpose of this chapter, we build on this definition in defining operational flexibility: the extent to which TO participants alter their behavior in response to requests from other TO participants. Given that time, task, and team are central elements in TOs (Bakker, 2010; Lundin & Söderholm, 1995), requests for flexibility at an operational level may pertain to among others the timing of activities, the number and quality of tasks performed, and the number of people involved. However, to our knowledge there are no studies which systematically categorize types of flexibility requests or responses within TOs at an operational level. Such a categorization can provide detailed insights into the dynamics of temporary interorganizational collaboration, and is useful to the extent that responses may

[8] This flexibility at an operational level differs from the more commonly researched topic of contractual flexibility (e.g., Young et al., 2003), which is predominantly occupied with flexibility at a strategic level and parties' willingness to modify contracts in the course of changing environmental conditions and unforeseen contingencies (Reuer & Ariño, 2007). Our focus in contrast is on flexibility at an operational level, among other things because behavior occurring within interorganizational exchanges is said to be hardly determined by the type of governance, e.g. contract, used (Blois, 2002).

vary with the type of request made. The range of responses to requests can be broader than simply positive or negative. In her paper on organizational responses to institutional pressures, Oliver (1991) identifies five types of responses, ranging from passive compliance to active resistance. Applying this work to the context of interorganizational collaboration, Lui and Ngo (2005) distinguish between five types of responses to requests: acquiescence (complying with the request), compromise (complying with the request while trying to seek a concession), avoidance (disregarding a request while concealing this), defiance (refusing a request while openly communicating this to the requestor), and manipulation (trying to influence the requestor and/or the request). This typology suggests that responses to operational flexibility requests can be more nuanced than simply positive or negative.

In trying to enhance our knowledge on operational flexibility requests and responses within TOs, we seek to answer the following research questions:

- *Which types of operational flexibility requests do participants in TOs make?*
- *What are typical responses to requests for operational flexibility in TOs?*

3.2.2 Time and flexibility

Time and its dimensions are by definition crucial elements in TOs. All TOs have in common that they have an ex ante defined termination point, at which they cease to exist (Kenis et al., 2009). The time span between TO initiation and TO termination can vary widely across TOs: while some TOs exist for only a couple of weeks, others may live on for more than fifteen years (Kerzner, 1994; Shenhar, 2001). Although collaboration within TOs of short duration is likely to be different from collaboration within TOs of longer duration, the distinguishing factor of TOs is not duration, but limited duration, i.e. the ex-ante defined ending point which is known to all TO participants. Time within TOs is thus limited from the start, and this fact is argued to have an effect on TO participants' behavior. The ex-ante defined termination point often creates a productive sense of urgency among TO participants (Jones & Lichtenstein, 2008). This time urgency results in task prioritization and the scheduling of tasks within the available time (Conte, Landy, & Mathieu, 1995). It can make TO participants become immersed in the task at hand (Saunders & Ahuja, 2006). To the extent that TO participants consider flexibility important for the realization of tasks, one may expect that the TO's impending termination point as well as in-between deadlines induce them to behave in a flexible manner. Impending termination however can also have the opposite effect, especially

when participants display 'end-game behavior' (Selten & Stoecker, 1986). The rationale behind this is that when collaboration is known to end in the foreseeable future, TO participants will focus more strongly on their self-interests, e.g. by being inflexible so that they can avoid additional expenses resulting from complying with flexibility requests. Yet, although TOs are by definition temporary, relations between TO participants can recur and endure across TOs (Jones & Lichtenstein, 2008), creating shadows of the past and future and giving collaboration a more permanent character (Poppo, Zhou, & Ryu, 2008). A shadow of the future can increase TO participants' willingness to make short-term sacrifices, e.g. when responding positively to partner requests, in order to realize long-term benefits (Axelrod, 1984; Klein-Woolthuis, Hillebrand, & Nooteboom, 2005). A shadow of the past can also increase flexibility, especially if prior collaboration between TO participants has led to the development of interorganizational trust (Gulati, 1995). The effect of TOs' ex ante defined termination point on operational flexibility displayed by its participants may then be moderated by shadows of the past and future. Overall, still, the drivers of flexibility within TOs including the effects of time remain unclear at best (Bakker, 2010). Therefore, we also try to answer the following, third, research question:

- *What are drivers of operational flexibility within TOs, and what is the impact of time?*

3.3 Methods

3.3.1 Research context

Our research was conducted in the Dutch shipbuilding industry. Shipbuilding is a complex industry in terms of technology and organization (Coenen, 2008). Ships are technically highly complex products. This is especially true for the Dutch shipbuilding industry, which in order to stay ahead of foreign competition has to focus on the building of technically complex vessels that are difficult to copy by low-wage countries. Consequently, these vessels consist of many advanced subsystems and components that need to be integrated. Such complex, high value products are also known as 'CoPS' (Hobday, 2000). Building these vessels also comes with a high level of organizational complexity. Seventy years ago shipyards used to perform all the work in-house, but the production process has been externalized over the past few decades (Levering et al., 2013). Shipyards nowadays do not have the capacity and knowledge to build complex vessels on their own, so they make use of specialized subcontractors (e.g.,

electrical companies, painting companies, carpenters) and suppliers[9]. This means that the Dutch shipbuilding industry organizes its production in the form of interorganizational TOs. On an executive or a managerial level, shipyards and subcontractors structure their working relationships by formal contracts in which tasks, rights, and responsibilities are written down. On an operational level participants rely on planning instruments to coordinate interorganizational actions. But these initial plans often a) are incomplete because it is impossible to foresee and write down every future aspect of work; or b) turn out to be infeasible due to unforeseen contingencies in combination with the technical and organizational complexity of building ships. When initial plans no longer suffice, project participants are called upon to be flexible with regard to these plans to make sure the vessel is delivered on time. However, the Dutch shipbuilding industry recently acknowledged that the quality of collaboration between shipyards and subcontractors, including the flexibility between them, is often suboptimal (Levering et al., 2013). The importance of flexibility in shipbuilding in combination with the perceived suboptimal level of flexibility within shipbuilding projects, make this industry a suitable research context. For this study we investigate the building of a complex, special purpose vessel in the Netherlands.

3.3.2 Characteristics of the TO under study

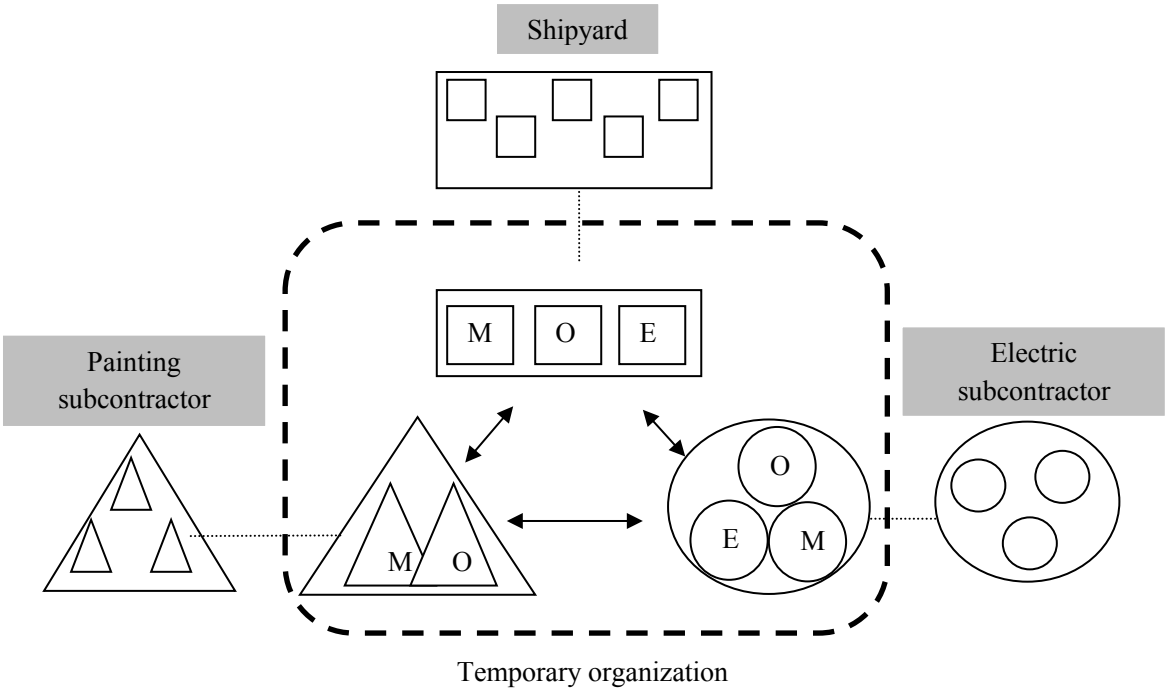
The hull of the TO studied – a yacht-like vessel which we for confidentiality reasons will call 'ZeroOne' from here on – arrived in the Netherlands in the autumn of 2011. ZeroOne was delivered to the end customer at the end of the summer 2012. ZeroOne was of a one-off nature: the shipyard had not produced a similar type of vessel before, nor a vessel of this size. Consequently, the shipyard needed to obtain expertise from various subcontractors, including subcontractors with whom they had not collaborated before. In addition, ZeroOne participants were often called upon to be flexible because the environment of ZeroOne was hardly stable and predictable. This was due to the newness of ZeroOne, changing customer preferences during ZeroOne, the high level of interdependence between participants, and the impossibility and impracticality of writing down all tasks and activities beforehand. The high level of interdependence between ZeroOne participants involved for example that a delay of one party

[9] Please note that there is a difference between subcontractors (who execute various specialized tasks on board) and suppliers (who 'merely' deliver materials and components). Our focus is on the collaboration between shipyard and subcontractors and between subcontractors themselves. The role of suppliers is not taken into account.

seriously affected the work of other parties. On ZeroOne, one shipyard, eight subcontractors and over a hundred suppliers were involved. As is usual in shipbuilding once the start of a project approaches, participating organizations began staffing the project with their employees. From a shipyard's perspective, this meant selecting engineers for calculation and drawings, selecting a project manager who acted as the overall coordinator, and selecting staff to carry out the actual work on the vessel, including a production manager to supervise the staff. Next to that, the shipyard picked the subcontractors to perform parts of the work. These interorganizational relations and the exchanges taking place within them were initially structured by means of formal contracts. On ZeroOne these formal contracts came in the form of more or less standardized documents that specified what a subcontractor would be delivering and against what price. Subcontractors, once they had been selected for the vessel, appointed a project manager who mainly dealt with financial control. They also selected a production manager to supervise the staff carrying out the work on board of ZeroOne. Depending on their role, subcontractors sometimes also carried out engineering tasks. All these individual managers and employees acted as boundary spanners between the organizations involved in the project, and they acted as our informants, even if sometimes the flexibility request or response originated from higher managerial levels in their organizations. Figure 3.1 displays a simplified visualization of the project organization of ZeroOne. Note that only two subcontractors are displayed, while in fact eight subcontractors were involved.

FIGURE 3.1

Simplified visualization of the temporary organization of ZeroOne



M = Managerial level employees; O = Operational level employees; E = Engineers

3.3.3 Research design

Our limited knowledge of operational flexibility within TOs and how this is influenced by time, calls for an explorative, longitudinal, and in-depth analysis which we undertake via a qualitative single case study design (Yin, 2003). Such a design is particularly well-suited when little is known about the dynamics of the phenomenon of interest, and aids in building theory (Eisenhardt, 1989), in our case on flexibility and time within temporary organizations. An a priori specification of the central constructs helps to shape the initial design and aids in interpreting the data (Eisenhardt, 1989). We focus on flexibility requests (interorganizational partner requests concerning operational issues), responses to these requests (the way and the extent to which partners comply with each other's requests) and the drivers behind these responses, with a specific focus on the impact of time. Rather than presenting a-priori conjectures regarding the relationships between these three sets of concepts, we aim to

contribute to a theory on operational flexibility and time in TOs on the basis of our empirical exploration (cf. Eisenhardt, 1989).

In doing case study research, preferably the selection of a case rests on theoretical groundings (Glaser & Strauss, 1967). In our situation, ZeroOne was considered to provide us with the best insights into the phenomenon we wanted to explore due to the uniqueness, complexity and length of the project and the large number of subcontractors involved. So we meet the recommendation to examine 'revelatory' cases in which the process of interest is transparently observable (Pettigrew, 1990; Yin, 2003).

3.3.4 Data collection and analysis

Following Eisenhardt (1989) our empirical evidence results from the analyses of a combination of data collection methods, specifically semi-structured interviews and observations, which are triangulated to provide stronger substantiation of constructs and relations. The data collection process started with observations of ZeroOne participants' behavior in weekly project meetings, which had an average length of 75 minutes. During these meetings, shipyard personnel (typically the project manager, the assistant project manager, the production supervisor, and the lead engineer) and subcontractor personnel (typically the production supervisor of each subcontractor) sat together to discuss operational issues. Because the project meetings focus solely on operational issues, they are considered appropriate settings for observing flexibility requests and responses to these requests. We assume that the responses to requests given during the project meetings were reflecting actual practice on board. Important arrangements were written down in meeting minutes, which were distributed to the participants afterwards. Also, the presence of other organizations likely functioned as a social control mechanism, making it less likely that participants made false promises. To capture the findings of our observations, we used an observation protocol (see Appendix B). The protocol was divided into two rows. In the left row we wrote down what we actually observed, and in the right row we wrote down – both during the project meetings and afterwards – what we perceived to be going on using more theoretical concepts. This procedure allowed us to show how we arrived at more generalized theoretical claims on how flexibility plays out within this specific temporary interorganizational collaboration setting. In total 22 project meetings were attended during the period October 2011 – June 2012. This period covers the production phase of the vessel. The production of the hull (before this period) and the commissioning of the vessel (after this period) are not covered. However, the

interviews do provide some information on collaboration and flexibility during the latter period.

After the first project meetings, observations were used to design and adjust an interview protocol. In this way we could improve the questions in terms of reflecting participants' experiences (cf. Harris & Sutton, 1986). Interviews were held with nearly all the project meeting participants, who we considered the ideal informants because of their daily engagement with operational issues. The semi-structured interviews contained questions on among others the types of requests made and received by participants, responses to these requests, and drivers behind these responses. We also discussed other interorganizational collaboration practices, either brought up by the interviewer based on earlier observations during project meetings, or indicated by the interviewee as being important aspects of the collaboration process. This additional information enabled us to critically evaluate our findings on flexibility and to place the findings in their context. Next to the interviews with these – mainly operational-level – participants, we conducted interviews with the project managers of the various subcontractors. These project managers did not or only seldom attend the project meetings but from the earlier interviews they appeared to have some influence on flexibility at the operational level. We further performed interviews with some other informants, for example the shipyard's purchasing manager. These individuals were included because their importance in terms of their influence on and experience with flexibility became clear during the data collection (cf. Burgelman, 1983). Finally, we gathered background information by means of personal notes during site visits, informal conversations with project participants, and by means of presentations and discussions during external meetings with shipbuilding executives and consultants.

Data analysis followed an iterative process in which data collection and data analysis frequently overlapped and influenced each other (cf. Eisenhardt, 1989; Glaser & Strauss, 1967). The data obtained from both the interviews and observations were analyzed using 'the Gioia method' (e.g., Corley & Gioia, 2004), meaning that the analysis started with open coding. Open coding uses first order codes, i.e. language used by the respondents or – in the absence thereof – a simple descriptive phrase (van Maanen, 1979). Then we searched for linkages between these codes (axial coding), which enabled us to assemble them into higher-order themes. Finally, similar themes were gathered into overarching dimensions. While constructing the so-called first-order concepts, second-order themes, and aggregate dimensions, we continuously compared the emergent constructs and relations between them

with the data (cf. Strauss & Corbin, 1990). This enabled us to come up with valid theoretical contributions which were closely linked to the data (Eisenhardt, 1989).

A critical aspect of case study research is presenting the empirical evidence (Eisenhardt & Graebner, 2007). To present the results in a systematic manner, the results section starts with our overall data structure (cf. Corley & Gioia, 2004), which links the various constructs to each other. The data structure provides an upfront general overview of our central findings. Appendices C, D and E provide additional information on how the first order codes have been grouped into second-order themes. The reliability of the presented results heavily depends on how candid the respondents were. Especially from a subcontractor's point of view, fear of putting themselves in a bad light vis-à-vis the shipyard could induce answers that are socially desirable. We have tried to overcome this by emphasizing the anonymity of answers given and by focusing not only on self-proclaimed drivers but also on 'attributed' drivers, why participants think other parties behave in a flexible or inflexible manner. The trustworthiness of the presented results is further secured by combining interview data with the observation of actual behavior of participants during project meetings. Also, the results have been presented to and discussed with both project participants as well as shipbuilding executives from other shipyards and subcontractors.

3.4 Results

The data structure on the next two pages summarizes the main findings of our analysis. In the following we discuss the findings in more detail, showing how the first order concepts, second order themes and aggregate dimensions are related. We successively discuss the types of flexibility requests made by ZeroOne participants, the responses to these requests, and the drivers of these responses.

FIGURE 3.2

Data structure

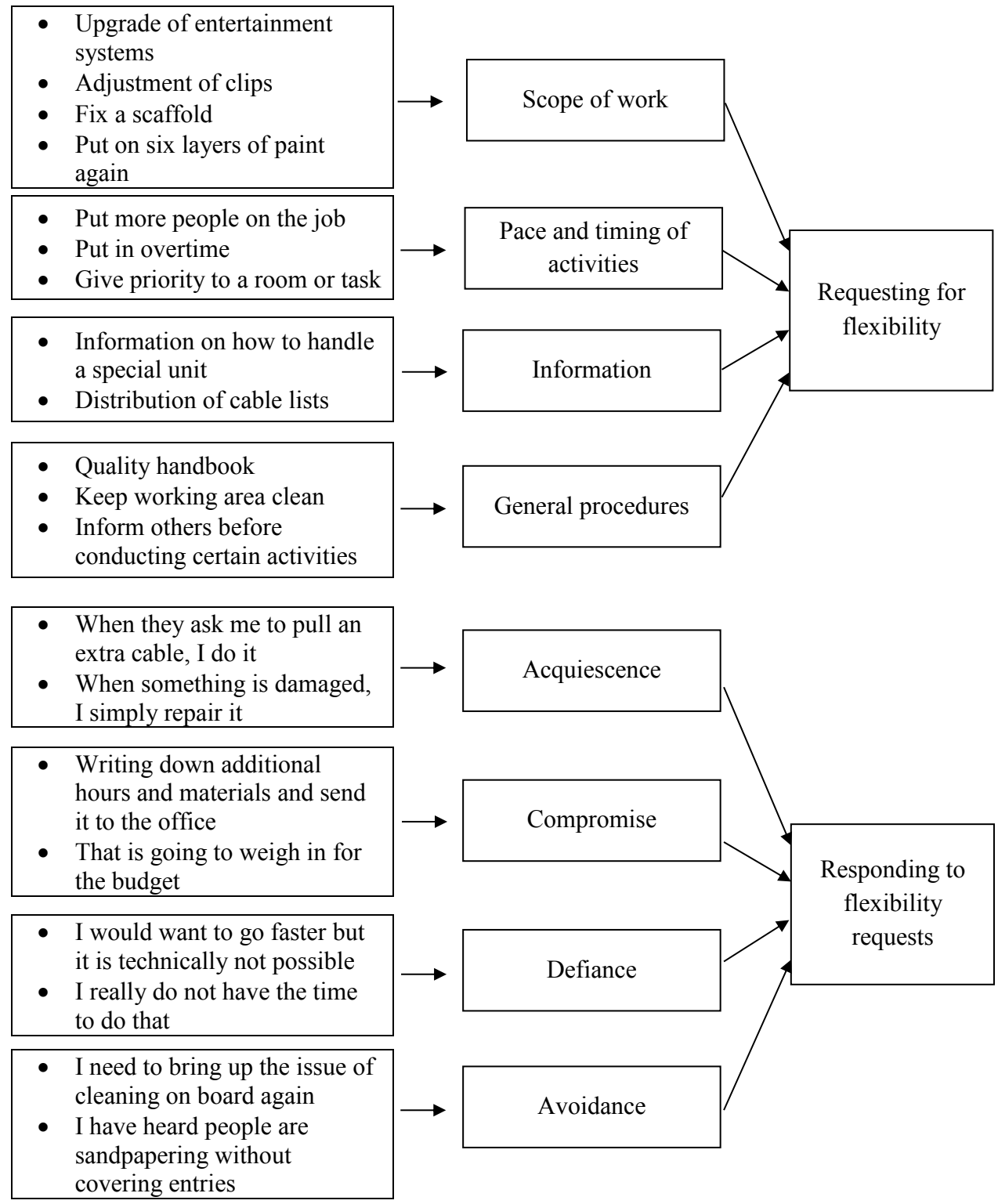
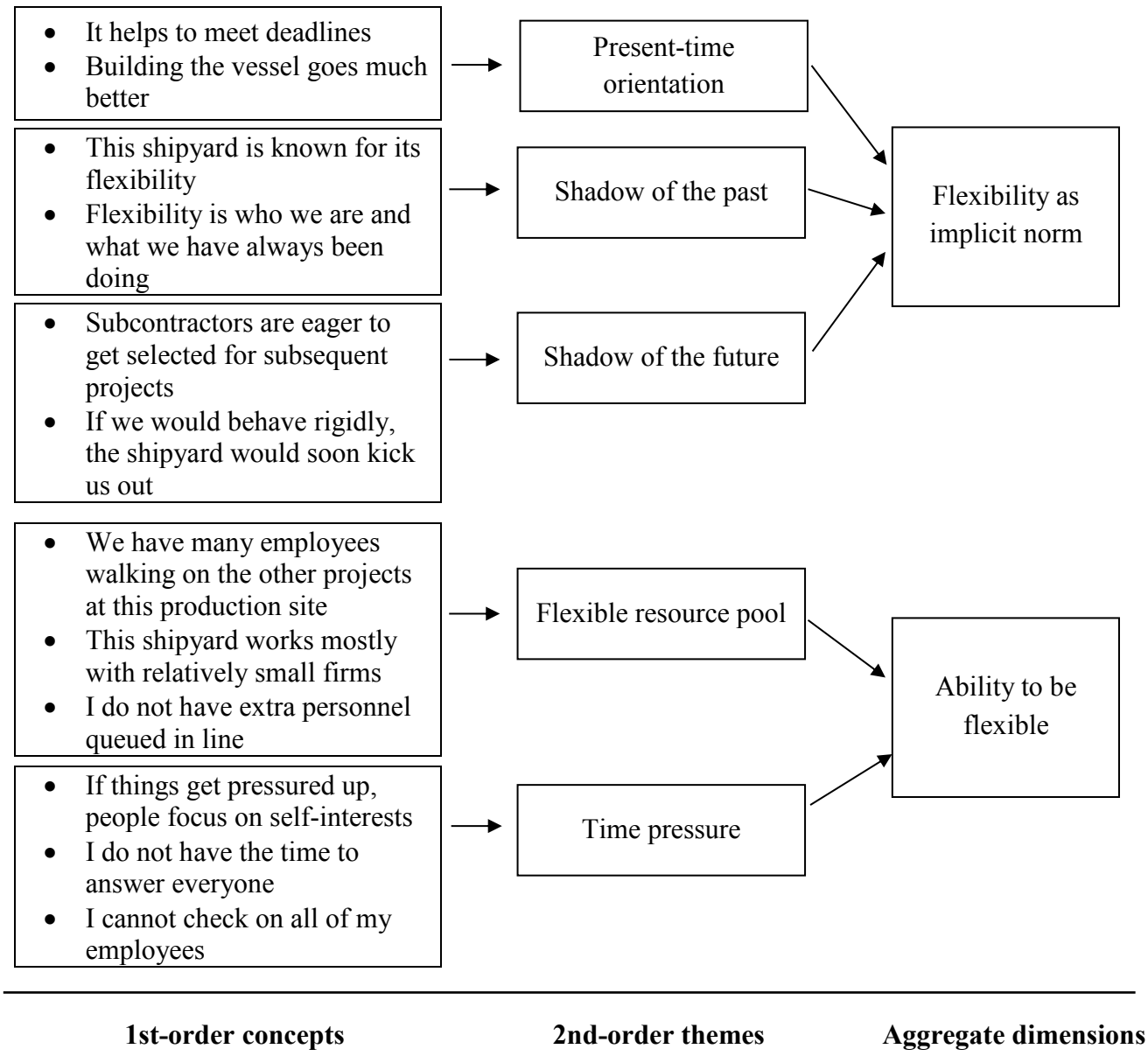


FIGURE 3.2

Data structure (continued)

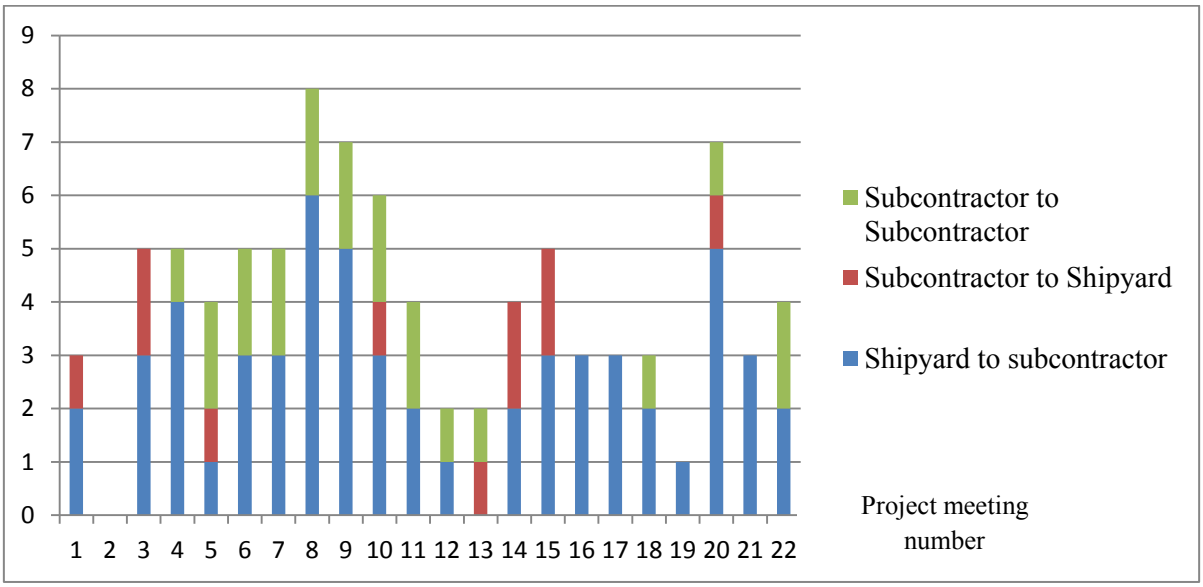


3.4.1 Types of flexibility requests

During the production period of ZeroOne, shipyard and subcontractors on a regular basis made requests to one another. During the project meetings, the majority of requests were directed from shipyard (usually the project manager or the production supervisor) to subcontractor (usually the production supervisor). Requests from shipyard to subcontractor were made continuously during the project. This is not surprising since the shipyard acts as the lead organization and has the task to coordinate and monitor overall progress as well as the progress of individual subcontractors. During the project meetings, requests from subcontractor to shipyard and between subcontractors occurred less frequently. Figure 3.3 provides an overview of the directions of requests and the number of times they occurred, as observed during the project meetings. For example, during the first project meeting, we observed two flexibility requests from the shipyard to subcontractors, and one request from a subcontractor to the shipyard. It should be noted that these numbers do not pertain to the total number of requests on ZeroOne. Respondents indicated that the process of requesting and responding was an ongoing process and was certainly not confined to the project meetings. The numbers presented in the following figures are based on what we explicitly could observe during the project meetings and give an indication of the patterns of requests and responses.

FIGURE 3.3

Distribution of direction of requests



We identified four different types of requests: requests concerning the scope of work, requests concerning pace and timing of activities, requests for information, and procedural requests. Requests concerning the *scope of work* can be divided into requests for additional work and requests for rework. These requests are considered flexibility requests because they increase the number and type of activities that have to be performed by the requested party. Requests for additional work usually came from the shipyard and were directed to the various subcontractors. For example, the end customer desired several upgrades of the entertainment system on board, and the shipyard passed on this request to the responsible subcontractor. This involved a request for additional work because the initial agreement between end customer and shipyard (and subsequently shipyard and subcontractor) on the requirements and specifications of the entertainment system did not suffice anymore due to changing customer preferences. Smaller requests also occurred. For example, sometimes the interior painter asked the shipyard to arrange a scaffold so that the painter could do his work effectively. Such requests were not born out of incomplete plans or unforeseen contingencies. Rather these requests were made to facilitate the building process. These requests can be considered flexibility requests because they require, although limited, time investments and slightly changed behavior from the requested party. Concerning requests for rework, one of the subcontractors was asked by the shipyard to adjust the clips used to attach television sets to the walls, because the original clips of the subcontractor did not fit. This request, the result of an unforeseen contingency, involves a request for rework because the clips had already been assembled. Requests for rework were also made when finished work had been damaged. It occurred regularly that the interior painter had finished his work in one room and that later on another subcontractor or shipyard personnel, during their operations in that same room, damaged the work of the painter. The recovery of damaged work was considered part of the daily routine by the interior painter, but nonetheless required additional investments in time and resources, or the flexible arrangement thereof.

Requests concerning *pace and timing of activities* were among others the result of participants falling or expecting to fall behind schedule, and served also to align the actions of all parties working aboard. These are considered flexibility requests because they require additional investments in time or changing the planned sequence of activities. The project had one fixed, major deadline, being the delivery of the vessel to the end customer. But there were many in-between deadlines like the completion of major technical rooms such as the engine room, or the launching of the vessel into the water. When participants expressed their concerns about

whether they were going to be able to meet the planning, the shipyard asked subcontractors to put more people on the job or to put in overtime. These requests involved pace because requested parties had to speed up their working processes. It required flexibility because, taking into account upcoming milestones, the current way or pace of working did not suffice anymore. Related requests are requests concerning the timing (or sequencing) of activities. Interdependence between participants created situations in which one subcontractor could only proceed with a task when another subcontractor had finished his. For example, the painter had to finish the thruster room before the isolator could start isolating. In situations like these, the isolator requested the painter to complete that specific room before moving on to another room.

From the interviews and observations we derived a third category of requests, namely requests for *information*. Shipyard and subcontractors were dependent on each other's information in order to be able to conduct their work properly and timely. This information provided participants with input for one's own activities. The pipefitter for example was dependent on information from the shipyard's engineering department on how to handle a special unit that was placed on deck by the shipyard. Subcontractors were also dependent on other subcontractors' information. The electrician for example asked for cable lists which had to be provided by the navigational equipment subcontractor. These information requests were not trivial matters as they involved quite some man-hours for the 'sending' party. Information sharing required flexibility from the requested parties in the sense that they had to spend time to sort things out and that during this time they could not give attention to other tasks. In addition, sometimes requesting parties could not continue their work until specific information from another party was available, resulting in waiting hours and an increase in costs.

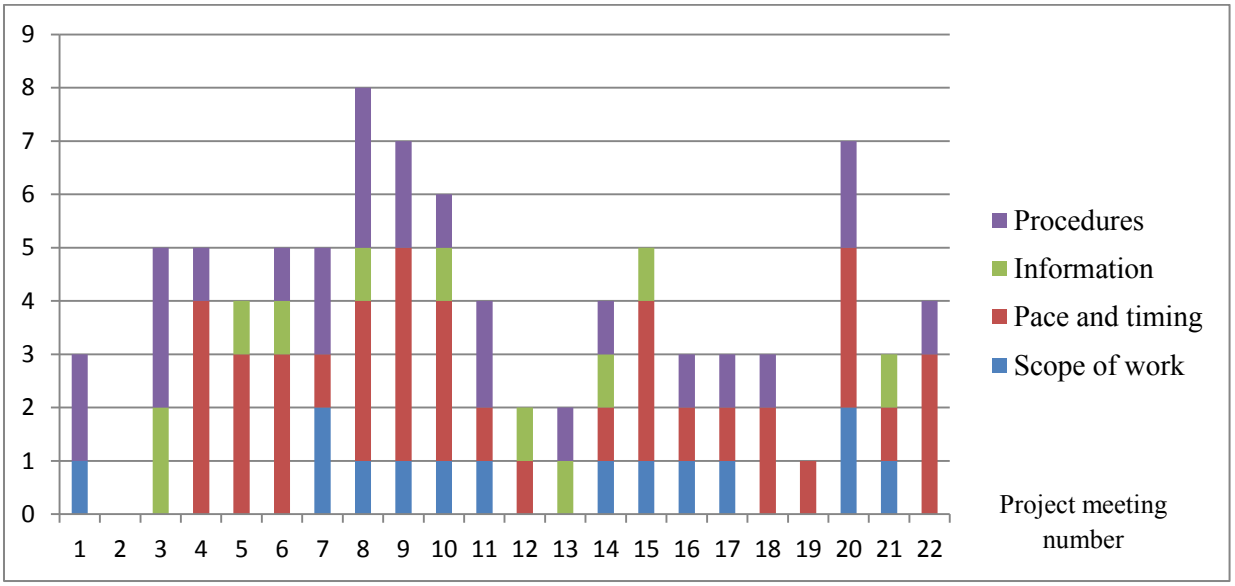
The fourth identified type of request concerns *general procedures*. These requests were typically made by the shipyard and they were not directed to one specific subcontractor, but rather to the collective of parties who were involved with the actual production of the vessel. For example, before the start of the project the shipyard composed a quality handbook with guidelines and principles on how to produce high-quality work on board and how to protect finished work. In addition to that, during project meetings the shipyard's project manager on a regular basis requested participants to keep their working area clean. He motivated project participants to clean the ship every Thursday afternoon and underlined that this was not a request without obligation. Similar requests were – on a less frequent basis – also made by

subcontractors. The isolator for example asked everyone in the case of foreseen damages to isolation, to first come to the isolator instead of taking the isolation away on their own. Requests concerning general procedures required flexibility because most parties, including shipyard personnel, were used to build 'work vessels'. During the building of work vessels, cleaning requirements during the building phase are less strict and important than during the building of the yacht-like vessel under study. This means that participants could not rely on their standard working routines but that they had to adjust their working practices to meet the new standards.

Requests concerning pace and timing of activities as well as procedural requests occurred more frequently than the other two types of requests (see Figure 3.4). Requests concerning pace and timing of activities occurred in nearly all project meetings. Requests concerning additional work and rework were most prevalent halfway the building phase. This is probably because in the beginning initial plans were followed but as the project progressed, plans turned out to be incomplete or wrong. Information requests follow more or less the same pattern. Here also, participants relied on initial plans but required additional information when these plans turned out to be incorrect or incomplete. Somewhat surprising is the observation that procedural requests continued to occur regularly, even until the building phase was nearly at its end. It suggests that procedural requests were insufficiently met in previous stages of ZeroOne and that repeating those requests did not change behavior concerning procedures. We come back to this observation in the next section, in which we take a closer look at the related responses to the various types of flexibility requests.

FIGURE 3.4

Distribution of types of requests



3.4.2 Responses to flexibility requests

From the interviews and observations we derive four types of responses to flexibility requests during the project. The requested party a) carried out the request without payment, b) carried out the request under the condition of financial compensation, c) refused the request and openly communicated this to the requestor, or d) did not carry out the request and concealed this from the requestor. We label these responses 'acquiescence', 'compromise', 'defiance', and 'avoidance' respectively (cf. Lui & Ngo, 2005)[10]. We consider acquiescence and compromise to be flexible responses as in both cases participants comply with the request. The difference between the two responses is that in the latter case requested parties bill the requestor for the additional man hours or material needed to carry out the request, or at least intend to do so. Compared to acquiescence and compromise, we consider defiance and avoidance inflexible responses because in these cases requests are not carried out. The difference between these two responses is whether the non-compliance is openly communicated to the party making the request (defiance) or not (avoidance). In the latter case,

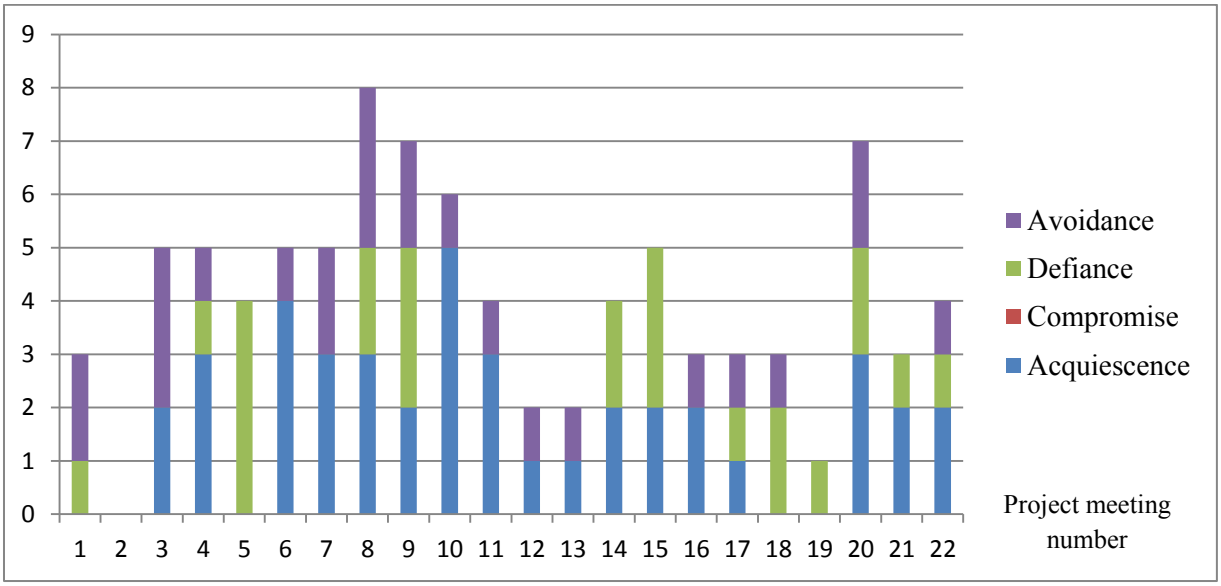
[10] Lui and Ngo's (2005) framework mentions a fifth type of response, namely 'manipulation'. Manipulation in our context would involve trying to change the request. However, we have found no empirical support for this type of response and thus leave it out of consideration.

requested parties conceal their non-cooperation and try to reduce their contact with the requestor on the issue at hand.

Looking at the distribution of observed responses during production phase, we see that acquiescence, defiance, and avoidance were dominant responses in comparison to compromise (see Figure 3.5). The absence of compromising responses during the project meetings can be explained by the fact that financial issues were being dealt with at higher managerial levels. These were handled by the shipyard's project manager and the subcontractors' project managers, of which the latter group did not attend the project meetings. Acquiescence was found throughout the entire process and was the dominant response, suggesting that in general ZeroOne participants behaved in a flexible manner. Yet the number of inflexible responses (defiance and avoidance) was slightly higher than the number of flexible responses. Interestingly, when the end of the production phase was approaching, defiance became an equally frequent response as acquiescence. The observations during the project meetings suggest that this was not the consequence of end-game behavior, i.e. the intentional pursuit of short-term self-interest as the end of the project approaches. Rather, participants experienced severe levels of time pressure so that they could not comply with all the requests, but instead had to carry out some remaining tasks after the vessel had been launched into the water.

FIGURE 3.5

Distribution of responses to requests



When combining the types of requests and responses, some interesting patterns show up (see Table 3.1). Typically, participants complied with requests concerning scope of work. During the project meetings we observed fourteen explicit requests of this type, and all but two were complied with. Thus, ZeroOne participants were flexible with regard to these types of requests. In contrast, concerning procedural requests, participants tended to be inflexible. Participants showed a tendency to neglect requests for cleaning on board, following safety regulations, and other working procedures that were generally addressed (24 out of 25 requests). This tendency was repeatedly brought up by the shipyard during project meetings, indicating that non-compliance was observed. As subcontractors seldom communicated this non-compliance to the shipyard, their behavior in this respect can be classified as avoiding. In only one occasion the project manager did commend the parties for keeping their working space clean. Compared to scope of work requests and procedural requests, responses to requests concerning information and the pace and timing of activities were more diverse. In some instances ZeroOne participants complied with these types of requests, in other instances they did not. For example, participants showed compliance when delivering requested information completely and on time to the relevant parties, or when successfully placing additional personnel on the project to increase pace. They showed non-compliance when they withdrew information or when they failed to increase pace. During the project meetings we

counted 39 explicit requests concerning pace and timing of activities: flexible (20) and inflexible (19) responses were distributed equally over these requests. From the eleven explicitly observed requests for information, eight received a positive response (acquiescence) while the other three received inflexible responses. In the next section we try to explain these patterns in the relationship between requests and responses and their occurrence by zooming in on the conditions under which ZeroOne participants did or did not comply with requests.

TABLE 3.1

Relations between types of requests and responses

		Type of response			
		Acquiescence	*Defiance*	*Avoidance*	**Sum**
Type of request	*Scope of work*	12	2	0	**14**
	Pace and timing	20	19	0	**39**
	Information	8	2	1	**11**
	Procedures	1	1	23	**25**
	Sum	**41**	**24**	**24**	**89**

3.4.3 Drivers of responses to flexibility requests

As discussed, *acquiescence* was a dominant response to requests concerning scope of work and pace and timing. The respondents mentioned several factors that in their opinion made them comply with partner requests without asking financial compensation. First, participants indicated that flexibility was necessary in order to complete the building process in time. The participants created and experienced an atmosphere in which problems were being solved without unnecessary delays by quickly taking up small issues (responding positively to scope of work requests), by moving to another part of the ship to carry out work (requests concerning timing of activities), or by providing each other timely with sufficient information (information requests). Second, according to most participants – on the side of both shipyard

and subcontractors – flexibility was one of the core values of their organization, and as such part of their organizational culture. Flexibility then was not a specific behavior geared to other ZeroOne participants, but a general way of working developed over previous projects and applied more or less automatically to present projects. Third, participants and especially the subcontractors indicated that being flexible was somewhat obligatory in order to keep the shipyard satisfied. They believed that inflexibility would result in the shipyard selecting other organizations to do their work in future projects. Flexibility then was considered a precondition to be selected on subsequent projects. In addition to that, the shipyard had the tendency to select the same set of subcontractors for the execution of their projects. Thus, as far as partner selection is concerned the shipyard had a long-term orientation as well. These expectations of future interaction gave the collaboration between shipyard and subcontractors a more permanent character. These expectations made it less likely that participants displayed end-game behavior, i.e. self-interested behavior when, and because, the end of the project was approaching. Fourth and finally, participants indicated that being flexible, specifically concerning pace and timing, was conditional upon whether one had the opportunity to comply with requests in terms of available resources. For example, some of the subcontractors were working not only on this project but also on other projects at the same production site. This enabled them to quickly pull resources from one project to another if the situation (usually the shipyard) asked for that. From this we conclude that a flexible co-located resource pool was another driver of flexible behavior during ZeroOne.

Compromise was a response that occurred when requests concerned additional work or rework. ZeroOne participants came up with one major driver to this response, namely the scale of a request. They asked for compensation only when complying with a request required substantial investments in resources like time and man-hours. However, compensation was handled by higher management and therefore seldom discussed during the project meetings.

Next to the flexible responses of acquiescence, inflexible responses like defiance and avoidance also occurred. *Defiance* was predominantly a response to requests concerning pace and timing of activities, and to requests for information. Respondents brought up two reasons for defiance: the absence of a flexible resource pool, and time pressure. First, in the absence of a flexible resource pool, some participants were forced to deny requests, simply because they did not have personnel available at that time and thus were unable to comply with requests. This finding is in line with the earlier mentioned positive effect of having a flexible resource pool on acquiescence. Second, experienced time pressure was considered a logical

explanation why sometimes requests for information were not being met. So although the limited amount of time on the one hand increased flexibility because participants considered flexibility necessary to meet deadlines, time limitations also led to inflexibility when participants experienced not having enough time to adequately respond to requests.

The final type of response encountered – especially during our observations – was *avoidance*, where participants did not carry out procedural requests but concealed their non-compliance by not openly communicating this to the shipyard. It was difficult to discover the drivers behind this behavior because during both the interviews and observations participants hardly mentioned this issue. One subcontractor's production supervisor told during a project meeting that he could not continuously check up on his personnel and that he could only talk with his people about their conduct. It seems then that parties did not follow procedures strictly because they were able to get away with it due to lack of supervision. Avoidance was collective behavior and less observable compared to the other types of responses. In addition to that, procedural requests seemed less crucial for delivering the vessel on time than the other requests so that participants may have considered flexibility on this aspect less important.

3.4.4 Flexibility and the influence of time

Generally, our findings point out that several dimensions of time played a central role during ZeroOne. The reported drivers of acquiescence suggest that flexibility was an implicit norm for many participants, which was not specific to ZeroOne but which had developed over past projects. This argument is underlined by the observation that the orientation towards acquiescence (i.e., flexibility) was displayed already in the beginning of ZeroOne, and did not need to be developed during ZeroOne. Participants behaved flexibly because that is how they were used to behave based on experiences developed in the past. Because the majority of ZeroOne participants worked together in previous TOs, an institutional collaboration framework had emerged in which flexibility was prominently present.

Furthermore, flexibility was driven by a clear time and task focus, i.e. a motivation to deliver ZeroOne on time to the end customer. Participants considered flexibility imperative to accelerate the production process in order to meet the deadlines. In other words, the limited duration of ZeroOne created a sense of urgency among participants and a focus on the present. One can ask why flexibility was the norm instead of inflexibility, because sticking rigidly to plans and time schedules (i.e., inflexibility) can also be a strategy to meet deadlines. Then again, sticking to original plans can only work out well when the environment of a

project is sufficiently stable and predictable. This was not the case with ZeroOne as participants had to deal with unforeseen contingencies like changing customer preferences and incorrect initial plans. On some occasions, the limited duration of ZeroOne also had a negative effect on flexibility, namely when participants experienced severe time pressure and were because of that unable to comply with requests. Thus, time limits can on the one hand increase flexibility because of a focus on task completion, but on the other hand it can decrease flexibility when participants face high levels of time pressure.

Finally, ZeroOne participants behaved flexibly because of their long-term orientation, i.e. an orientation on the time after project completion. From the point of view of the subcontractors, behaving flexibly was imperative to increase the chance of being selected for upcoming projects. Subcontractors become more attractive partners if they behave in a flexible manner, complying with requests from the shipyard and other subcontractors. They become more attractive because flexibility improves the chance that the overall project goal is realized, i.e. delivering the vessel to the end customer on time and according to specifications. For subcontractors repeated assignments generate a more or less continuous income, which positively affects the continuity of the organization. This induces subcontractors to be flexible not only towards the shipyard, but also towards the other subcontractors. After all, if one subcontractor slows down the process of other subcontractors by behaving inflexibly, the shipyard feels the consequences as well because of the highly interdependent nature of jointly producing vessels. From the shipyard's perspective, long-term orientation is reflected by their tendency to work time after time (i.e., TO after TO) with the same set of subcontractors. According to ZeroOne participants, this makes collaboration in general more efficient because parties know each other's strengths and weaknesses and are able to act on them.

From the above we conclude that ZeroOne participants displayed different 'time orientations' simultaneously, all of which positively impacted flexibility: a past-time orientation (i.e., we are being flexible because we have always been doing it this way), a present-time orientation (i.e., we need to be flexible in order to finish the task), and a future-time orientation (i.e., we are behaving flexibly in order to be selected on future projects). However, experienced time pressure, which we consider also part of a present-time orientation, hampered flexibility (i.e., sometimes we are not being flexible because we do not have the time to comply with requests). In addition to the different time orientations of ZeroOne participants, we did not find any evidence for changing behavior over the course of the project, like end-game behavior: the distribution of responses over the course of ZeroOne shows that flexible and

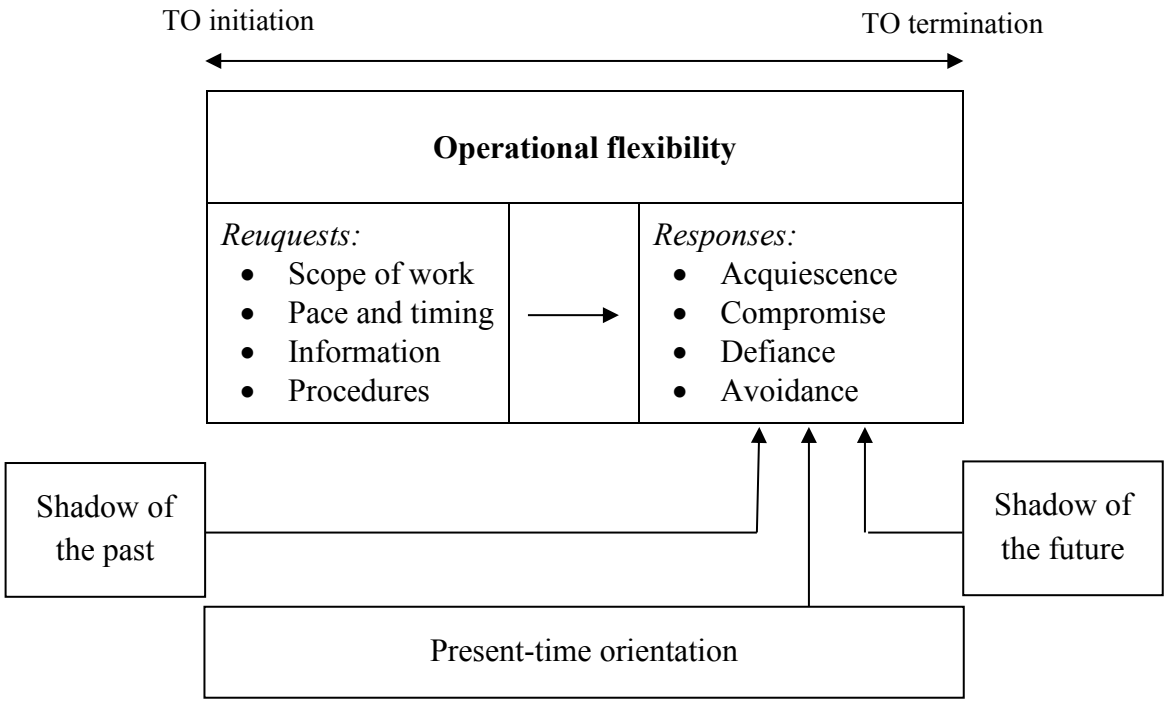
inflexible responses were more or less equally frequent across the different stages of production. We observed only a slight increase of defiance towards the end, but we blame this on experienced time pressure instead of on the intentional pursuit of self-interests as the end of ZeroOne was approaching. This suggests that a possible negative effect of limited duration on operational flexibility – in the form of end-game behavior – was neutralized by shadows of the past and future.

3.5 Discussion and conclusions

Across TOs, lead organizations can adapt to changing external demands like changing customers by relying on different configurations of partner organizations (Bechky, 2006; Hobday, 2000). Building on this idea of flexibility *across* TOs, we provide insights into the relatively underexplored territory of operational flexibility *within* TOs, advancing our knowledge of the dynamics of collaboration within this specific type of interorganizational collaboration. We show that next to TOs' ex ante defined termination point, these dynamics are influenced by factors relating to the period before and after TO existence: temporary organizations are no islands (cf. Engwall, 2003; Manning & Sydow, 2011). Instead, TO participants carry with them shadows of the past while also taking into account shadows of the future. Also, we show that operational flexibility is a multi-dimensional construct encompassing various types of requests (scope of work, pace and timing, information, and general procedures) and responses (acquiescence, compromise, defiance, avoidance). These findings are visualized in Figure 3.6.

FIGURE 3.6

Framework of operational flexibility and time within temporary organizations



The identified drivers of operational flexibility have several important implications for theorizing on the influence of time on flexibility behaviors within TOs. Conventional project management literature treats time as linear and objectively given (Clark, 1994). This is reflected in TO participants' present-time orientation and in their primary focus on completing tasks on time (Atkinson, 1999; Bakker & Janowicz-Panjaitan, 2009). Our findings contrast and enrich this literature, showing that time is not merely a boundary condition but a much more complex, subjective, and socially constructed phenomenon (cf. Blount & Janicik, 2001; Chan, 2012; Cunha, 2004; Orlikowski & Yates, 2002). It is complex, because TO participants turn out to have multiple time orientations, all of which affect flexibility behaviors in their own way. First, a past-time orientation positively impacts operational flexibility if participants because of previous TOs have become used to act flexibly and more or less automatically continue this behavior in the present TO. As such, participants' (shared) experiences in previous TOs create structured role systems, converging expectations, and other kinds of institutions (Bechky, 2006; Kadefors, 1995). Second, a present-time

orientation, i.e. an orientation towards the time remaining until TO completion, positively impacts operational flexibility if participants consider flexibility imperative to finish the job. This suggests that TO participants develop a clear task-focus because of TOs' limited duration (cf. Jones & Lichtenstein, 2008; Saunders & Ahuja, 2006). Yet, a present-time orientation can also lead to inflexibility if participants experience time pressure and cannot find the time to reply (adequately) to partner requests (cf. Nordqvist, Hovmark, & Zika-Viktorsson, 2004). Third, a future-time orientation positively impacts operational flexibility if participants consider flexibility in the current TO a condition for future collaboration (cf. Ivens, 2005). This is consistent with earlier work on the positive effects of a shadow of the future on cooperation, flexibility, and trustworthy behavior (Axelrod, 1984; Bó, 2005; Heide & Miner, 1992). A future-time orientation differs from a past-time orientation in that it rests on calculative grounds. TO participants purposefully act flexibly because of a shadow of the future. A past-time orientation contains non-calculative elements: flexibility behavior is the consequence of taken-for-granted norms. A present-time orientation seems again calculus-based: flexibility is displayed because of its perceived importance for finishing the task at hand.

Time is also subjective and socially constructed, as TO participants show variety in their orientations towards the same time. How TO participants value shadows of the past and future is intimately shaped by the social and organizational context in which they operate (cf. Blount & Janicik, 2001). These shadows are given meaning among others through the process of collaboration. TO participants will for instance attach less value to a shadow of the past and adjust their behavior accordingly if, despite a shared history, their current partners display inflexibility during collaboration in the present TO. In addition to that, recent work on temporal perspectives of organizational responses to climate change (Slawinski & Bansal, 2012) shows that some organizations tend to focus more on the immediate present, while other organizations also take into the account the past and the long-term future.

TO participants can carry with them experiences from previous TOs, expect future collaboration with current participants, and focus on meeting the current deadline(s) all at the same time. This contradicts early work on time orientations which states that when participants focus on the present, they automatically neglect shadows of the past and future: "a person [participating in a TO] lives more in the psychological present, coping with immediate demands and simultaneously forgetting the past and neglecting plans for the future" (Miles, 1964, p. 457-458). Instead, we posit that past-, present-, and future-time

orientations can occur simultaneously. A present-time orientation will be more or less automatically present among TO participants. After all, every TO from the beginning has a goal which has to be achieved in a limited amount of time, creating some sense of urgency and some level of time pressure for all participants. This cannot be said for shadows of the past and future. Given their demonstrated importance for flexibility behaviors within TOs – and the implicit presence of a present-time orientation – in the following we suggest a configuration of TOs based on the presence or absence of shadows of the past and future. This demarcation results in four possible configurations. Below we discuss these configurations and the expected level of operational flexibility within these configurations.

In configuration I, participants have never or seldom worked together before and expect no future collaboration, making the TO the 'organizational equivalent of a one-night stand' (Meyerson, Weick, & Kramer, 1996). On the other extreme, in configuration II, all or most participants share a long history of collaboration and expect to continue working together in upcoming TOs, as is often the case in for example the construction industry (Jones & Lichtenstein, 2008). This would give collaboration a more permanent character, despite the temporary nature of each single TO. Building on our findings, we suggest that in the second configuration (sharing a past and a future) TO participants are more likely to display flexibility than in the first configuration (no past, no future). In the remaining configurations either a shadow of the past or a shadow of the future is dominantly present. In configuration III, participating organizations share no or only a short history of collaboration but do expect to continue collaboration in future TOs. Here, TO participants will be oriented more towards the future than the past. One may wonder if TO participants are more likely to display flexibility in this configuration than in configuration IV, where a shadow of the past is more prevalent than a shadow of the future. Poppo et al. (2008) found that a shadow of the future was more important for the development of trust between parties – which is closely linked to flexibility – than a shadow of the past. Following this line of reasoning, we expect that a shadow of the future can compensate for an absence of a shadow of the past, and thus that a shadow of the future is more important in explaining flexibility behaviors than a shadow of the past. Consequently, in configuration III, the level of operational flexibility will be higher than in configuration IV (see Table 3.2).

TABLE 3.2

TO configurations and operational flexibility

		Shadow of the future	
		Low	*High*
Shadow of the past	*Low*	Configuration I: Low level of operational flexibility	Configuration III: Moderate to high level of operational flexibility
	High	Configuration IV: Moderate to low level of operational flexibility	Configuration II: High level of operational flexibility

As final theoretical implication our findings reject the idea that relational norms like flexibility do not develop within TOs because of their short or limited duration (Meyerson et al., 1996). Rather, we posit that driven by shadows of the past and future, relational norms can be present in TOs, despite their ex ante determined end point (cf. Engwall, 2003; Starkey, Barnatt, & Tempest, 2000; Sydow & Staber, 2002). Flexibility then does not necessarily develop within a TO (e.g., Ness & Haugland, 2005), but across a number of subsequent TOs. Therefore, we suggest a reconsideration of the influence and importance of what is generally regarded as the central characteristic of TOs, their ex ante defined termination point, by taking into account shadows of the past and future.

The findings suggest several practical implications. If flexibility within projects is of high importance, lead organizations should try to work with a stable set of partners. Although this carries the danger of lock-in effects, they can benefit from repeated collaboration because it facilitates coordination due to learning effects. It can create a collaboration culture in which all participants are focused on finishing the task and are looking beyond their self-interests. If partners work with each other on multiple projects simultaneously this also helps to create flexibility because personnel can be shifted from one project to another. TO participants can further facilitate flexibility by maintaining a flexible resource pool so they can increase or lower pace when the situation requires that. Still, one important limitation of flexibility is that it runs counter to operational efficiency (Olsson, 2006). Flexibility implies deviation from

original plans, so that when original plans are correct and adequate, there is less need to make an appeal to flexibility. However, due to the complexity of TOs in terms of the products delivered and the organization required, it is practically impossible to foresee and write down all future aspects of work. Flexibility thus remains important and may best be described as a necessary evil. Future research could focus specifically on the consequences of flexibility, in order to get a more informed discussion on when flexibility is a good or a bad thing.

There are some limitations to this study which may be addressed in future research as well. Due to the qualitative nature of this study, generalization of results to a broader context is an issue. Interorganizational interaction processes in the specific context of yacht-like vessels may well differ from collaboration processes during the building of work vessels. They may also differ from collaboration in other industries, or in other types of TOs, for example in TOs without a lead organization and where power differences are differently distributed (Provan & Kenis, 2008). Nonetheless, our findings may be applicable to other settings in which multiple organizations work on a complex product in a limited time period (e.g., construction). Future research could also compare collaboration processes within TOs with collaboration processes in other interorganizational collaboration types like alliances. A dominant view in the TO literature is that these organizational forms, because of their impending termination, are unique and trigger different social processes compared to other interorganizational collaboration settings like alliances (Kenis et al., 2009). However, repeated alliances between the same partners are not an exception (e.g., Goerzen, 2007). Consequently, alliance partners may have past-, present-, and future-time orientations as well. So although from a theoretical point of view there may be various reasons to treat temporary and non-temporary organizations differently, in practice they may be more similar than is commonly assumed. Such research could shed light on the uniqueness of TOs compared to other interorganizational collaboration types as well as on the assumed importance of TOs' ex ante defined termination point.

Another interesting research venue pertains to the determinants and consequences of various time orientations. Under which conditions do TO participants rely more on the past, and when more on the present or future? What is the influence of time orientations on other relational mechanisms like trust (Gulati & Sytch, 2008)? Furthermore, can we identify conditions under which these orientations improve collaboration? It has been shown that for example shadows of the past can also have negative consequences for collaboration (Katz, 1982; Uzzi, 1997). Finally, large-scale, quantitative inquiries could improve and generalize knowledge on

flexibility in temporary organizations, including insights on the relative importance and interaction between time orientations.

In conclusion, this chapter set out to explore flexibility behaviors of participants in a temporary organization and how aspects of time partly explain these behaviors. We show that operational flexibility is a multi-dimensional construct by empirically distinguishing different types of flexibility requests and responses. Operational flexibility within TOs is fueled by a combination of participants' past-, present-, and future-time orientations. The presence of these orientations implies that collaboration dynamics within TOs are at least partially influenced by forces outside of TOs. It also explains why relational norms within TOs do develop, despite TOs' limited duration. We suggest a reconsideration of the influence and importance of what is generally regarded as the central characteristic of TOs, their ex ante defined termination point, by taking into account shadows of the past and future. Because of these shadows, temporary organizations appear to be not so temporary after all.

4. Better understanding TO amnesia and its cure: A multi-process analysis of learning across temporary organizations

4.1 Introduction

Organizations often participate in a stream of TOs (Lampel, Scarbrough, & Macmillan, 2008). Consequently, they could benefit from learning across TOs, e.g. by transferring lessons learned from one temporary organization to another (Brady & Davies, 2004). Generally, learning is considered essential for the development of organizational capabilities and for bringing competitive advantage (Nelson & Winter, 1982). Learning across TOs, defined here as the extent to which organizations and individuals realize change across two subsequent TOs (cf. Albino, Garavelli, & Schiuma, 1998; Bartsch, Ebers, & Maurer, 2013), improves practices and products, and prevents organizations from making the same mistakes (Kasvi, Vartiainen, & Hailikari, 2003; Lampel et al., 2008; Prusak, 1997).

To accomplish cross-TO learning, organizations can rely on a combination of learning mechanisms, specifically experience accumulation, knowledge articulation, and knowledge codification (Prencipe & Tell, 2001; Zollo & Winter, 2002). Experience accumulation involves individuals taking their accumulated experiences with them from one temporary organization to the next one. It is a semi-automatic process[11] allowing for efficient specialization and coordination. Knowledge articulation concerns two or more individuals figuring out what works or what does not work by means of discussion, and taking this knowledge with them to subsequent TOs. In comparison to experience accumulation, knowledge articulation is a more deliberate process in which opinions and beliefs are verbally expressed and shared. Knowledge codification involves making acquired knowledge explicit which can then be retrieved in subsequent TOs, also by individuals who have not participated in the codification process. Knowledge codification can be seen as an extension of knowledge articulation, and occurs through the use of for example manuals and databases.

Despite the use of these mechanisms, practice shows that organizations find it difficult to learn across TOs (Newell et al., 2006). The successful transition from acquiring knowledge during one TO – either through experience accumulation, knowledge articulation, knowledge

[11] We interchangeably use the terms ‘mechanism’ and ‘process’ as we consider accumulation, articulation, and codification to be both learning activities as well as facilitators of learning.

codification, or any combination of the three – and applying this knowledge during a subsequent TO is not automatically or easily achieved. Development of solutions to encountered problems generates the knowledge to achieve cross-TO learning (Lampel et al., 2008), especially in TOs that accomplish unique tasks where it is difficult to rely on past routines (Hobday, 2000). But experiencing problems (experience accumulation), discussing them (knowledge articulation), and writing down solutions (knowledge codification) during collaboration in a TO does not necessarily mean that these problems are fixed or that solutions found are applied in a subsequent TO. In fact, often organizations find themselves reinventing the wheel and making the same mistakes time after time rather than improving practices and products (Cacciatori, Tamoschus, & Grabher, 2012; Prusak, 1997). This 'TO amnesia' – organizations' seeming inability to put into use what is learned across TOs – can result among other things in higher production costs and longer production times, both of which undermine the competitive position of organizations (Levering et al., 2013). It becomes important then to identify not only the factors that determine when or why a learning process is activated, but especially the conditions that hamper or strengthen the effectiveness of these processes, i.e., the conditions under which these mechanisms lead to actual change across TOs.

TO amnesia seems to be an example of what has been labeled the learning paradox (Bakker et al., 2011b; Cacciatori, 2008; Hobday, 2000; Scarbrough et al., 2004): the involvement of multiple organizations in a TO provides ample learning opportunities, but the created knowledge is likely to dissipate when the TO comes to an end and participants disband, thereby impeding effective experience accumulation. Knowledge articulation and codification are also problematic in a TO context due to the organizations' primary emphasis on finishing TOs on time and within budget (Grabher, 2002a; Perminova, Gustafsson, & Wikström, 2008). This makes it less likely that time and efforts will be spent to articulate and document lessons learned. In line with these ideas, the limited duration of TOs and the time pressure experienced by their members have been both theoretically and empirically identified as major barriers to learning across TOs (Grabher, 2004a). In addition, TOs are usually formed for the accomplishment of complex and unique tasks (Hobday, 2000), which can lower the value of transferring often highly specific knowledge to subsequent TOs.

As discussed, previous studies on barriers to cross-TO learning have emphasized explanations based on the limited duration and time pressure prevalent in TOs. However, we propose that this perspective does not fully take into account the complex multi-process and multi-actor nature of learning that comes into play with learning *across* TOs. First, the barriers to cross-

TO learning are likely to differ between the learning mechanisms distinguished. Time pressure indeed can put a hold on knowledge articulation and codification activities. But it seems fair to assume this is only of minor importance when subsequent TOs are comprised of the same set of experienced organizations and individuals who function as a project memory (Grabher, 2004b). Similarly, the limited duration of TOs becomes less relevant once knowledge is codified (Zollo & Winter, 2002). Codified knowledge can be transferred to, assessed and used in subsequent TOs by organizations and individuals that did not participate in the codification process. Second, time pressure and limited duration predominantly explain why learning in a TO does not occur in the first place. But these factors fail to give insight into the conditions under which learning in a TO also leads to learning across TOs. For example, articulating and codifying knowledge within one TO does not automatically lead to the use of that knowledge in a subsequent TO. Third and finally, pointing at time pressure and limited duration as the two central barriers to cross-TO learning suggests a rather deterministic perspective, namely that learning can hardly ever take place in this context. After all, every TO is by its very nature of limited duration, and this automatically imposes some level of time pressure on participants. But there are studies that do report actual learning despite these boundary conditions, pointing for example at the importance of continuity in the set of organizations and individuals across TOs (Bartsch et al., 2013; Swan, Scarbrough, & Newell, 2010).

Because of these considerations on the current literature on cross-TO learning, we believe there is an opportunity to further deepen our knowledge of the subject (cf. Kenis et al., 2009). To better understand why learning across TOs fails or succeeds, and to provide project managers with suggestions for better tools to enhance the impact of such learning, we conduct a systematic longitudinal case study of two subsequent interorganizational projects in the Dutch shipbuilding industry. We empirically explore under which conditions learning mechanisms adopted in the first TO result in actual changes (e.g., in products or practices) in the second TO. These TOs accomplish similar tasks (i.e., the production of a complex yacht support vessel), creating a suitable context for the examination of learning effects. Our empirical exploration sheds light on the complexity of learning across TOs by taking a multi-process perspective (cf. Sydow et al., 2004). We answer the following research question: *Under what conditions do multiple learning mechanisms – experience accumulation, knowledge articulation, and knowledge codification – lead to effective learning across temporary organizations?* To foreshadow our findings, the analysis reveals two central,

related conditions under which cross-TO learning fails or succeeds: locus of change responsibility and alignment of change incentives. In case of an external change responsibility (i.e., the person experiencing a problem is not the same person in the position to tackle this problem) in combination with unaligned change incentives, learning across TOs is less likely to take place compared to when change incentives are aligned or when there is an internal change responsibility.

The remainder of the chapter is organized as follows. Next we discuss the theoretical background of our study, zooming in on the three learning mechanisms and the factors that enhance or inhibit cross-TO learning as identified in previous research. Then we discuss the methods used in our empirical study, followed by a presentation of the results. After the discussion of the results, we take a look at the theoretical and practical implications of our findings and draw our final conclusions.

4.2 Theoretical background

4.2.1 Learning across temporary organizations

It is proposed that organizational learning literature rests on four basic assumptions (Holmqvist, 2003). First, learning of organizations is mainly experiential. Organizational rules and practices change over time as a result of organizational experiences. Second, learning relatively permanently alters organizations' behavior. It changes the range of organizations' potential actions. Third, organizational learning is a social process. Organizations are comprised of groups of interacting individuals trying to make sense of their daily complex reality. And fourth, learning is reflected in organizations' standard operating procedures, practices, and other formal and informal organizational rules. Based on these assumptions, organizational learning can be defined as "the social production of organizational rules based on experience that leads to a changed organizational behavior" (Holmqvist, 2003, p. 98). In line with this definition, this chapter makes the assumption that learning implies change (Argote & Ophir, 2005). Organizations may be considered to have learned when the acquisition of new knowledge changes the range of potential behaviors (Huber, 1991), but it is the application and use of this knowledge that ultimately represents organizational learning (Albino et al., 1998; Bartsch et al., 2013). In other words, there is a difference between cognitive learning and behavioral learning (Crossan et al., 1995). Cognitive learning concerns changes in how organizations and their members interpret information and give meaning to situations, while behavioral learning represents actual change in organizations' actions. These

changes are reflected for instance in improved products and changed routines (Dodgson, 1993; Kasvi et al., 2003). The distinction between cognitive and behavioral learning is important because not only are they two different phenomena, also one is not necessarily an accurate reflection of the other (Fiol & Lyles, 1985).

Learning across TOs represents a specific type of organizational learning. Because of the involvement of multiple organizations, cross-TO learning can be characterized as multi-party and interorganizational (Holmqvist, 2003). Multi-party involvement provides TOs with access to a wider set of skills and ideas (Lampel et al., 2008). Organizations can learn about, with, and from other participants (Inkpen & Currall, 2004; Inkpen & Tsang, 2007; Leufkens & Noorderhaven, 2011). Learning about a partner organization for example can make collaboration more efficient as during collaboration participants become familiar with each other's complementary contributions and weaknesses. Learning with a partner occurs when two or more parties jointly enter a new business, while learning from a partner involves the transfer of knowledge from one organization to another. Yet learning across TOs can be of an intraorganizational nature as well, for instance when organizations reconsider – in relative isolation – the management of internal operations (Holmqvist, 2003). In addition, learning can take place at the individual, group, organizational or TO level (Crossan, Lane, & White, 1999; Grabher, 2002b). All this implies that learning across TOs takes place at multiple levels of analysis and can take different forms.

The generation of knowledge within TOs can be either a direct deliverable for the TO, or it can emerge spontaneously during the project as TO participants develop solutions to the problems they encounter (Lampel et al., 2008). The application of product knowledge can lead to technical improvements in delivered products, including their parts and technologies (Kasvi et al., 2003), while the experience of inefficient practices helps organizations reconsidering existing routines (Dodgson, 1993). Regardless of whether changes are product-oriented or practice-oriented and whether they are interorganizational or intraorganizational in nature, they are commonly assumed to be driven by a combination of three learning mechanisms: experience accumulation, knowledge articulation, and knowledge codification (Prencipe & Tell, 2001; Zollo & Winter, 2002). Following the above, we define cross-TO learning as observed changes in products or practices within a focal TO, resulting from a combination of experience accumulation, knowledge articulation, and knowledge codification processes activated in previous TOs.

4.2.2 Learning mechanisms

Experience accumulation refers to the process by which operating routines emerge based on the repeated execution of tasks (Argote, 1999). It reflects wisdom acquired through trial-and-error learning (Gavetti & Levinthal, 2000), or learning-by-doing (Arrow, 1962). Knowledge acquired through experience accumulation resides in the memory of individuals and as such is tacit (Singh & Zollo, 1998). This implies that learning across TOs via experience accumulation requires individuals using their accumulated experiences from previous TOs to change products or practices in subsequent TOs (Senge, 1990). Additionally, organizations can improve their understanding of what is needed to increase performance on subsequent TOs by critically discussing and reflecting on current practices and products (Prencipe & Tell, 2001; Zollo & Winter, 2002). This knowledge articulation involves deliberately figuring out what works and what does not work. It is a process in which tacit knowledge is verbally articulated through collective discussions and performance evaluation processes. The sharing of individual experiences can improve understanding of why practices are (in)effective and can result in adjustments. Knowledge articulation resembles learning-by-reflection, or learning-by-evaluation (Scarbrough et al., 2004). Thus, learning across TOs via knowledge articulation requires knowledge sharing between participants in one TO and the transfer and application of this knowledge in other TOs. Knowledge codification, a step beyond knowledge articulation, involves capturing lessons learned in manuals, databases, or software (Cacciatori et al., 2012). It creates a TO memory (Kasvi et al., 2003) and assists in making existing knowledge accessible to others (Nonaka, 1994). This systematic retention of experiences enables organizations to document effective problem solving mechanisms, while the documentation of mistakes or potential pitfalls helps reducing failure costs (Schindler & Eppler, 2003). Thus, learning across TOs via knowledge codification involves TO participants making use of codified information stemming from previous TOs.

4.2.3 Barriers to cross-TO learning

Relying on experience accumulation can be detrimental for learning across TOs if it is uncertain whether knowledgeable individuals will be involved in future TOs where the knowledge is needed, or whether they are willing to share their knowledge (Dodgson, 1993; Zollo & Winter, 2002). When configurations of organizations and individuals change across TOs, knowledge is likely to dissipate. However, having the same organizations and individuals involved in subsequent TOs can also be problematic. The current behavior of TO

participants is constrained by past behavior, suggesting that as organizations and individuals work together time after time, collaboration routines emerge which can be difficult to alter (Porter, 1990). There is thus a potential dark side to relying excessively or exclusively on experience accumulation. Reliance on the same set of organizations and individuals can create stagnation and inertia rather than change (Gargiulo & Benassi, 2000; Uzzi, 1997), which occurs when participants become stuck in their routines, stop searching for alternative ways of doing their work, and do not look for improved ways of collaboration. Thus, both having the same and different organizations and individuals involved across TOs can frustrate cross-TO learning.

Uncertainty about future collaboration with current TO partners can discourage knowledge articulation activities (Schwab & Miner, 2011). To the extent that benefits from what is learned materialize only in future collaboration with the same partner it becomes less attractive to invest time and efforts to obtain and share such knowledge. Thus, similar to experience accumulation, learning across TOs through knowledge articulation is hampered when over time different configurations of organizations and individuals are involved. In addition, time pressure, fear of opportunism or asymmetric learning intentions can also be barriers to knowledge articulation (Hamel, 1991; Keegan & Turner, 2001; Larsson et al., 1998).

Compared to experience accumulation and knowledge articulation, knowledge codification seems at first glance the least dependent on changes in TO staffing and organizational composition. Time pressure and budget constraints are considered major barriers to learning across TOs via knowledge codification (Keegan & Turner, 2001; Lampel et al., 2008; Lindkvist, Söderlund, & Tell, 1998; Swan et al., 2010). These boundary conditions diminish the chance that codification occurs at all. Once it does occur, the codified knowledge may not be applied if TO participants lack awareness that there is knowledge which could be helpful in improving their practices and products (Newell et al., 2006). In addition, they may lack the time to search for relevant information (Keegan & Turner, 2001), or lack the absorptive capacity to understand and apply codified material (Tsai, 2001). Thus, barriers to learning across TOs through knowledge codification include time pressure, lack of awareness and lack of absorptive capacity.

While the majority of the learning literature focuses on learning barriers, there is also research devoted to the factors that make learning successful. Without exception these factors relate to

the mechanism of experience accumulation. Some studies point to the importance of prior collaborations between organizations and the subsequent development of trust, and to long-term orientation (Larsson et al., 1998; Makhija & Ganesh, 1997). Others point to the importance of reliance on project-governing permanent organizations, or project management office leaders, who translate accumulated experiences into routines that are used across multiple TOs (Julian, 2008; Schwab & Miner, 2011). Similarly, social capital, i.e. the structure and quality of TO participants' ties, has been found to be a major contributor to cross-TO learning (Bartsch et al., 2013). Some studies even make the claim that effective learning can occur only through the accumulation of experiences amongst organizations and individuals (Swan et al., 2010). However, as we discussed, there are also limits to cross-TO learning via experience accumulation.

The considerations discussed above make clear that learning in the context of temporary organizations is difficult. It also shows that the activation of the learning mechanisms (which we consider cognitive learning) does not necessarily result in change across TOs (which we consider behavioral learning). Informed by the literature, Table 4.1 provides an overview of the barriers to the various learning processes. However, on the basis of the existing studies we can only make some very general surmises regarding the factors that promote or hinder learning from one temporary organization to the next. That is problematic, given the importance of TOs in contemporary economic society, and the benefits learning can provide the organizations populating them. Given this state of affairs, our study was designed to deepen our insights into the conditions under which experience accumulation, knowledge articulation, and knowledge codification can nevertheless result in effective learning across TOs.

4.3 Methods

4.3.1 Research design and research context

Because the goal of our study is to further deepen our limited knowledge of learning across TOs, we adopt a qualitative longitudinal case study design (Yin, 2003). A case-study approach is particularly useful to explore relatively unknown territory (Eisenhardt, 1989), while the longitudinal nature of our analysis allows for the detection of learning effects across TOs (Mayer & Argyres, 2004). This study examines two subsequent interorganizational TOs in the Dutch shipbuilding industry. To fully grasp the dynamics and complexity of learning across TOs, a multi-process perspective is taken (Sydow et al., 2004). We empirically explore

under what conditions experience accumulation, knowledge articulation and knowledge codification activities employed in the first TO lead to or hinder knowledge application (i.e., changes in practices and/or products) in the second TO. The three learning mechanisms represent cognitive learning as they increase the potential behaviors of TO participants, while the application of the acquired knowledge signifies behavioral learning. An a priori specification of the central learning processes shapes the initial research design and aids in interpreting the data (Eisenhardt, 1989). Our empirical exploration of the conditions under which these processes lead to cross-TO learning contributes to extending theory on interorganizational learning in temporary contexts.

TABLE 4.1

Possible barriers to cross-TO learning

Barriers to experience accumulation	**Source**
Changing configurations of organizations and individuals across TOs	Dodgson, 1993 Zollo & Winter, 2002
Involvement of the same set of organizations and individuals across TOs	Gargiulo & Benassi, 2000 Uzzi, 1997
Barriers to knowledge articulation	**Source**
Uncertainty about future collaboration with current partners	Schwab & Miner, 2011
Asymmetric learning intentions	Hamel, 1991
Fear of opportunism	Larsson et al., 1998
Time pressure	Keegan & Turner, 2001
Barriers to knowledge codification	**Source**
Time and money concerns	Keegan & Turner, 2001 Swan et al., 2010
Lack of absorptive capacity	Newell et al., 2006 Tsai, 2001

Shipbuilding is a project-based industry, in which shipyards and subcontractors collaborate – creating a multitude of interorganizational linkages – on a temporary basis to produce complex vessels. Though these temporary undertakings are initially not driven by learning incentives as opposed to for example learning alliances (Khanna, Gulati, & Nohria, 1998), learning is of high importance to bring down the costs of producing organizationally and technically complex vessels, to improve the quality of the end product, and generally to assure effective interorganizational collaboration and to fight (fierce and international) competition. However, the Dutch shipbuilding industry faces challenges with regard to lowering failure costs, which are among others the result of participating organizations making the same mistakes on more or less similar projects (Levering et al., 2013). The complex, temporary, and multi-organizational nature of shipbuilding projects in combination with the apparent difficulties to learn across projects make these projects a suitable research context.

Moreover, the studied projects are considered revelatory cases, and thus appropriate for providing the best insights into the phenomenon of cross-TO learning (Pettigrew, 1990; Yin, 2003). The phenomenon of interest is transparently observable because the first project – from here on referred to as 'ZeroOne' – contained ample learning opportunities. ZeroOne was a unique and complex project for the majority of participants in terms of size, vessel type, composition of the TO, quality requirements, and working procedures. First, most project participants had never before built a vessel of this size. This led to a relatively long production period, during which the shipyard had to coordinate and monitor many interdependent tasks carried out by a variety of parties. This in turn created a challenge for the planning and organization of ZeroOne. Second, the type of vessel produced was relatively new to the shipyard and most of the subcontractors in that they had not produced a similar vessel before. They were used to build 'work vessels', which are used by the owner first and foremost to make money (like for example dredging companies). The ZeroOne however was more of a luxury yacht than a working vessel. Its primary function was to bring the owner comfort and joy. Because of this unique vessel type, the shipyard had to rely on a number of subcontractors with specific expertise and experience with producing these types of vessels. These were subcontractors the shipyard had not collaborated with before. Also, the production of a luxury yacht came with several implications for quality demands and working procedure. Several respondents, both on the side of the shipyard and subcontractors, indicated that the quality and finishing requirements were much higher than what they were used to. Furthermore, there were strict working procedures during the building of the vessel. These

procedures pertained to among others protecting finished work and to keeping working areas clean. All this suggests that ZeroOne was receptive to the creation of new knowledge about both practices and products, which then could be put to use in the second project, from here on referred to as 'ZeroTwo'. We focus on the problems encountered by participants on ZeroOne, because ZeroOne was a unique vessel for the parties involved. The development of solutions to encountered problems generates the knowledge that can be used to realize improvements (Lampel et al., 2008). To the extent that the problems encountered on ZeroOne resulted in improved practices on ZeroTwo, we consider that learning across the two projects actually took place.

Although for many participants the ZeroOne was a unique type of vessel, they certainly did not enter the project completely unprepared. The majority of the participants selected to produce ZeroOne shared a long history of collaboration on other vessel types. These parties were not familiar with the production of luxury yachts, but they were familiar with each other as collaborating partners and had developed close personal relationships over time as well as collaboration routines. Only two of the eight subcontractors selected for ZeroOne were relative strangers, sharing no history of collaboration with the shipyard and no or limited previous collaboration with the other subcontractors. These two subcontractors – carpentry and exterior painting – were selected for their expertise on and experience with producing luxury yachts. The other subcontractors also carried with them their experiences which they could rely on. The subcontractor for heating, ventilation, and air-conditioning for example explained that on ZeroOne they used installations which they had used before on other vessels as well. Similarly, the interior painter told that their paining techniques had not evolved dramatically over the past thirty years. Thus, ZeroOne contained both unique as well as familiar challenges for its participants.

The ZeroTwo was, although a similar type of vessel, quite different from the ZeroOne. This was a consequence of the involvement of a new end customer, who brought along his own preferences. Also, the shipyard made some major changes to the outfitting of the ship, for example by selecting a different type of engine in order to make ZeroTwo faster than its predecessor. The shipyard's lead engineer explained that it took the engineering departments 16,000 hours to adjust the drawings from ZeroOne, and that 16,000 hours is normally enough time to develop a completely new ship type. Yet in some other respects the ZeroTwo was similar to the ZeroOne. Most importantly, the same organizations were involved, and also for most part the same individuals. This made ZeroTwo a suited project for its members to

implement what they had learned on ZeroOne. By selecting the same subcontractors, the shipyard made it possible to rely on their experiences accumulated during ZeroOne. The importance of experience accumulation for learning across the two vessels was underlined by the shipyard's production supervisor. He told that the production workers from a specific subcontractor got poor back-up from their office and that this frustrated the process. He also said that this would probably not improve on ZeroTwo. But still he wanted to keep the subcontractor on board because the production workers now had the experience from the ZeroOne. This shows that from a shipyard perspective, relying on a subcontractor's relevant experiences is highly important. It is so important that even when a subcontractor was not performing according expectations, the shipyard still selected them for similar vessels.

4.3.2 Data collection and analysis

The empirical data comes from two data collection methods: observations and semi-structured interviews. There were two separate rounds of data collection, one during ZeroOne and one during ZeroTwo. The data are triangulated, allowing for more confident interpretations of what we observed and what we heard from the respondents (Eisenhardt, 1989). The data collection process started with observing the behavior of ZeroOne participants during the production phase in weekly project meetings. These meetings were attended by shipyard employees (typically the project manager, assistant project manager, and production supervisor) and the production supervisors of the various subcontractors. In these meetings, each lasting on average 75 minutes, mainly operational issues were discussed. Observing the behavior of the meeting attendants offered the opportunity to acquire a view of the patterns of collaboration independently of what respondents chose to reveal in interviews. For the observations, we made use of an observation protocol. This protocol consisted of two rows: in the left row we noted what we factually observed or heard (e.g., a remark by the shipyard project's manager that a particular issue had to be taken into account for the next vessel), in the right row we wrote down what we perceived to be going on in more theoretical wordings (e.g. an intention to accommodate cross-TO learning). This procedure enables us to demonstrate how we derived more generalized theoretical explanations from in vivo language (van Maanen, 1979). The observations during ZeroOne were used to design an initial interview protocol. Halfway and at the end of ZeroOne the first round of interviews was conducted. We interviewed practically all project meeting participants, asking them what in their opinion could or should be improved on ZeroTwo. During ZeroOne we gathered about 1,000 observations in 22 project meetings, and conducted 28 interviews, which lasted on

average 50 minutes. The data collected during ZeroOne were used to adjust the interview protocol and to narrow down our observations for ZeroTwo (cf. Harris & Sutton, 1986). The observations of project participants during the project meetings on ZeroTwo, which were also held weekly and lasted on average 60 minutes, gave a first indication of what had improved and what had not in comparison to ZeroOne. Here we also made use of an observation protocol (for an example, see Appendix F). Changes in for example work practices – either observed or articulated by project meeting attendants – suggested that learning had taken place. During ZeroTwo we gathered about 700 observations during 20 project meetings. To get an understanding of *why* learning did or did not occur, additionally we conducted interviews with the attendants. This second round of interviews was conducted halfway ZeroTwo. The interviews contained questions about whether, how, and why practices or products had changed, product quality had increased, and mistakes were repeated, among others. During ZeroTwo we conducted 13 interviews which had an average length of 40 minutes. In addition, during the whole data collection process, background information was gathered by means of informal conversations with project participants, personal notes during site visits, and presentations of preliminary findings to project participants as well as shipbuilding executives and consultants. These activities further substantiate and validate our findings.[12]

Data analysis was executed following an iterative approach in which the obtained data was continuously analyzed and refined (Eisenhardt, 1989; Glaser & Strauss, 1967). To identify how and why learning from ZeroOne to ZeroTwo succeeded or failed, the first step involved determining if practices or products on ZeroTwo had changed or had not changed in comparison to ZeroOne. Understanding how this change had come about gave information on whether experience accumulation, knowledge articulation, knowledge codification or a combination of the three formed the basis of the changes in products or practices. Learning during ZeroOne in some instances led to the adjustment of practices during ZeroTwo. In these scenarios, we relied on our respondents to give insight in why learning succeeded. In other instances the adjustment failed. In these scenarios, we relied on our respondent to give insight in why learning failed. The conditions under which learning did or did not occur were

[12] As a limitation to our data collection, it should be noted that when the data collection ended – due to time restrictions – ZeroTwo had not yet come to an end. However, production was finished for about 70%, and over the course of ZeroTwo, participants had already observed some significant changes and stabilities.

retrieved through open coding (e.g., Corley & Gioia, 2004). Open coding starts with language used by the respondents, so-called first-order concepts (van Maanen, 1979). Then we looked for relations between the codes and grouped them into higher-order themes. Then, related themes were clustered into overarching dimensions. For example, verbal expressions by respondents that there are parties not seeing the bigger picture and focusing only on their own tasks (first-order concepts) can be labeled 'diverging interests' (second-order theme). Expressions that parties are willing to help each other out (first-order concepts) indicate converging interests (second-order theme). Combined, diverging and converging interests suggest that interest alignment (third-order dimension) plays an important role in cross-TO learning. A continuous comparison of concepts, themes, and dimensions with newly collected data permitted us to increase the validity of our theoretical claims (Eisenhardt, 1989; Strauss & Corbin, 1990). In the next section we present an overview of our results using a data structure (Corley & Gioia, 2004), showing how we combined the various concepts, themes, and dimensions that emerged from our data (Figure 4.1).

4.4 Results

In this section we first take a look at the learning mechanisms activated during ZeroOne, as well as the absence of learning activities where these would be expected. The latter provides insight in the conditions under which TO participants did not engage in certain learning activities. Then we discuss the changes in ZeroTwo observed or mentioned by our respondents (the learning successes) and the things that did *not* change on ZeroTwo, despite experienced problems on ZeroOne (the learning failures). As we will demonstrate, the analysis of the learning successes and failures reveals two major barriers to the effectiveness of the three learning mechanisms: locus of change responsibility, and alignment of change incentives. Representative quotations to back up our interpretations can be found in Appendix G.

4.4.1 ZeroOne

ZeroOne participants gained experience through the execution of their work. A general, major issue on ZeroOne was that while the project was running all participants found out (i.e., experience accumulation) that they had heavily underestimated the amount of work, which was a direct consequence of the newness of the project. Participants had to put in extra time and effort to find out on board what the vessel was going to look like. The drawings provided by the shipyard's engineering department were not always detailed enough, while in other

occasions what was drawn turned out to be technically impossible. Also, changes made by the end customer during production led to additional work, or rework of what already had been finished. As ZeroOne progressed, the amount of work turned out to be much higher than was originally assumed. Consequently, all parties exceeded their planned amount of hours. This problem was discussed occasionally during the project meetings, but without referring to how this should be handled on a next vessel. Instead, the focus during these meetings was on how to deal with the current situation on ZeroOne, without making practically any explicit reference to the future.

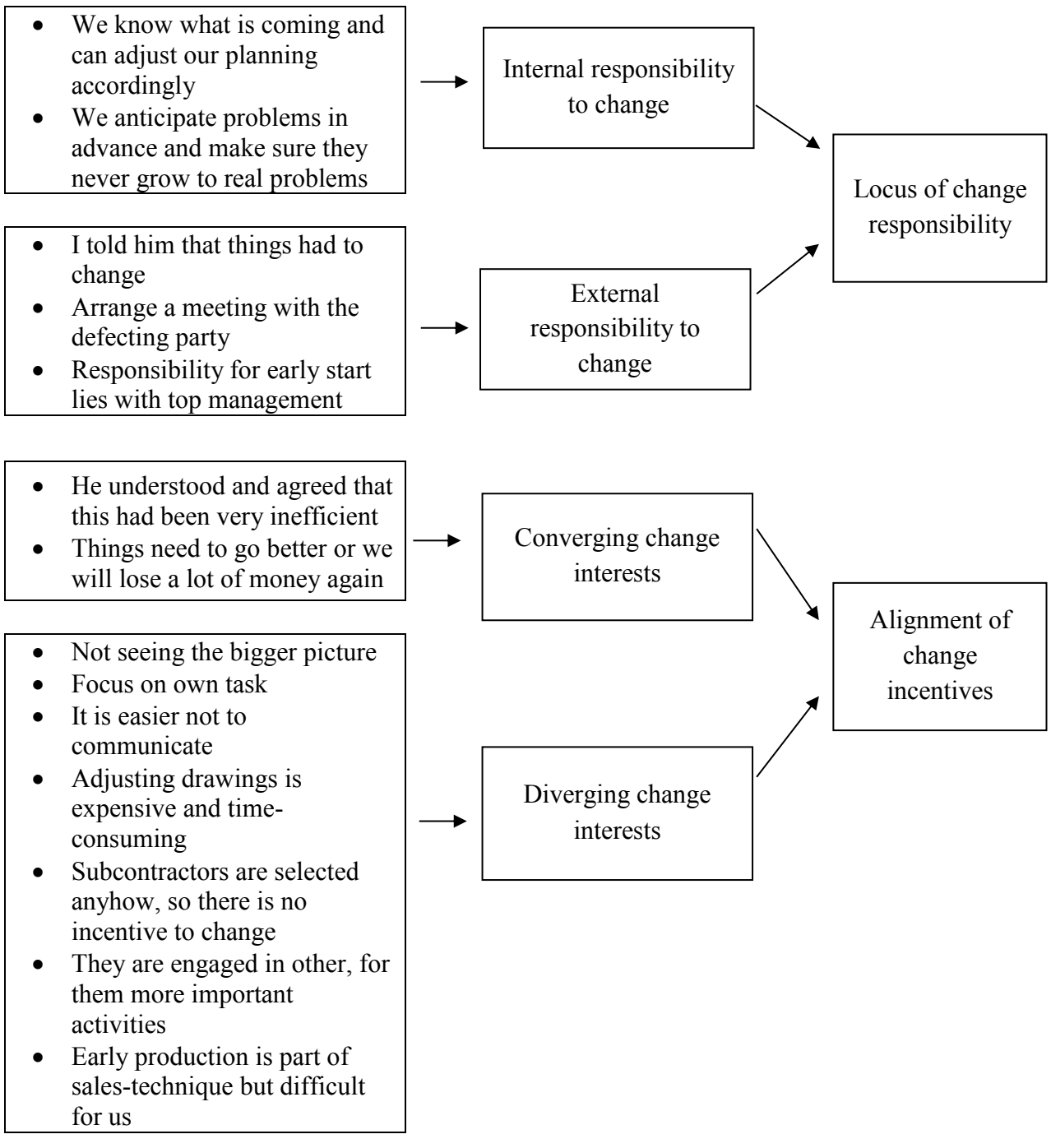
Next to these experiences based on execution of the job, the shipyard also engaged in the more deliberate learning process of knowledge articulation. For instance, the shipyard arranged several internal meetings during ZeroOne, attended by the project manager, production supervisor, lead engineer, and head purchasing. They discussed encountered problems on ZeroOne and made preparations for ZeroTwo, for example by already ordering major components for ZeroTwo which were delivered relatively late on ZeroOne. Next to these structured meetings, shipyard's production personnel also reported technical problems and difficulties to the shipyard's engineering department. These processes occurred at an intraorganizational level, as only shipyard employees were involved. However, interorganizational learning processes also took place. This consisted mainly of the shipyard's assistant project manager talking on an informal basis to the production supervisors of each subcontractor. He asked them among other things how they experienced the production process and how they thought the process could be improved on a next vessel. Thus, during ZeroOne the shipyard engaged in both experience accumulation and knowledge articulation activities.

The subcontractors also engaged in experience accumulation and knowledge articulation. The carpenter for example experienced serious delays of more than two months in the delivery of panels due to problems on the side of their supplier. When the first batch of panels finally arrived, they were delivered in the wrong order. As a consequence of this unforeseen contingency the carpenter could not start at the planned date and also not in the preferred areas. This was disastrous for the efficiency of the building process, not only for the carpenter but for the other parties on board as well due to their high level of interdependence. In response to the delays on the side of the carpenter, all parties had to adjust their pacing and sequencing of activities. At the end of ZeroOne, the carpenter arranged an internal evaluation with among others the CEO of the company and the employees directly involved in ZeroOne.

During this evaluation the issue with the delivery of the panels was discussed as well as other issues that could be improved on next vessels, resulting in a list of improvements. In addition, the carpenter kept a list on which incorrect drawings were reported. At the end of ZeroOne, this list was distributed to their own engineering department. Other subcontractors – who also had their own engineering department, like for example the electrician – followed similar procedures of reporting technical issues to their offices. For some subcontractors this was a continuous process, while others kept lists and documents and handed them over to their engineers at the end of ZeroOne.

FIGURE 4.1

Data structure



Knowledge codification activities were predominantly undertaken by the parties that engaged in engineering (i.e., the shipyard, carpenter, electrician, and navigational equipment installer). This involved adjusting the drawings based on problems reported by production personnel. Sometimes drawings were not detailed enough so that production personnel did not know what a room exactly would look like, while other times what was on the drawings turned out technically not feasible.

Based on the above findings, we conclude that all ZeroOne participants engaged to some extent in processes of experience accumulation, knowledge articulation, and knowledge codification. Still, sometimes a learning process did not occur or was not 'finished'. There was for instance no group evaluation (involving both shipyard and subcontractors) at the end of ZeroOne. According to the shipyard's assistant project manager and production supervisor, such an evaluation was not undertaken because it would be useless. He explained that subcontractors were too much focused on their own tasks, without taking into account the broader picture. As a consequence, subcontractors would only talk about their own specific problems and solutions to these problems, instead of looking at solutions from which the entire project could benefit. We interpret this as unaligned change incentives between shipyard and subcontractors which impede knowledge articulation activities.

There were also limits to knowledge codification. The shipyard experienced that subcontractors did not always report technical issues encountered on board to the shipyard's engineering. When subcontractors experienced these issues, often it was easier and faster for them to quickly solve the issue right away without investing time to communicate this to the shipyard. Although this accelerated the building process at that moment, the shipyard's engineering was unaware of the error. Consequently, the incorrect drawings could not be changed, so that on a next vessel the same mistake was likely to occur. In some occasions errors were reported – also by subcontractors – but they were not processed by shipyard's engineering in terms of adjusting the drawings. Economic considerations played a major role in the decision not to make these so-called as-built drawings. The updating of drawings costs a lot of time, and thus money. And because a next vessel will practically never be an exact copy, it is possible that a lot of the redrawing is useless. We interpret these situations also as change incentives of two parties – production personnel and engineering – that are not aligned, which hamper knowledge articulation and codification activities.

These findings further suggest that the three learning mechanisms are interwoven, with experience accumulation being the starting mechanism. During the execution of their work, ZeroOne participants discovered problems, which they then did or did not articulate to others. The articulation of experiences in turn was a prerequisite for knowledge codification to take place. This applied especially to ZeroOne, because the parties responsible for codification (the engineers) were not the parties experiencing and thus in the position to discuss encountered problems (production personnel).

Additionally we looked at the occurrence of references to learning during the project meetings (see Table 4.2). We counted the number of times project meeting participants referred to ZeroTwo during the construction of ZeroOne, and how many times they referred to previous vessels. We see that there is very little reference to previous vessels. During the 22 project meetings, only five times did a party refer explicitly to earlier projects and how they handled certain issues on these projects. This then gave an idea on how they could tackle current problems. The limited reference to previous vessels indicates the uniqueness of ZeroOne, and suggests it was difficult or even useless for ZeroOne participants to draw from past experiences. The same pattern applies to references to ZeroTwo. Only six explicit references to ZeroTwo were made during the project meetings. These references consisted of things that had gone terribly wrong on ZeroOne, and which therefore should be taken into account for the next vessel. The limited reference to subsequent vessels can be explained by the fact that the project meetings were first and foremost meant to solve current problems and to meet current deadlines, and not to see what could be improved on next vessels. Furthermore, as the start of ZeroTwo approached – and as ZeroOne came to an end – we saw no increase in the references to ZeroTwo. This also suggests that the focus was more on delivering ZeroOne on time than on making preparations for ZeroTwo. As we have discussed, articulation and codification of what could be improved took place predominantly outside of the project meetings, in other meetings or during informal communications.

TABLE 4.2

Learning references during project meetings ZeroOne

Meeting number	1	2	3	4	5	6	7	8	9	10	11	12
Explicit reference to earlier vessels					1				1			
Explicit reference to next vessels							1	3				
By whom					SY		SY	SY SC	SY			

Meeting number	13	14	15	16	17	18	19	20	21	22
Explicit reference to earlier vessels				1				1	1	
Explicit reference to next vessels						1	1			
By whom				SC		SC	SY	SY	SY	

SY = shipyard
SC = subcontractor

4.4.2 ZeroTwo

During the project meetings on ZeroTwo more than 80 explicit references to ZeroOne were made. Both shipyard and subcontractors continuously talked about how they handled situations on ZeroOne. The reference to future vessels however was – again – limited. Only four times did a meeting participant – in all cases the shipyard's lead engineer – talk about modifications and solutions that had to be taken into account on what would be 'ZeroThree' (see Table 4.3). This suggests the importance of experience accumulation and relying on the same set of organizations and individuals for realizing cross-TO learning.

During the interviews on ZeroTwo, respondents came up with three major changes which they considered improvements in comparison to ZeroOne. We refer to these changes as learning successes. The identified successes were: an increase in the shipyard's coordination capacity; improved planning; and a more efficient production process. For each success we

discuss what the change entailed, how it came about, i.e., via which learning mechanisms, and the conditions which made these learning mechanisms successful.

TABLE 4.3

Learning references during project meetings ZeroTwo

Meeting number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Number of explicit references to ZeroOne	5	5	4	3	6	6	6	6		5	3	5
Explicit reference to next vessel(s)										2		
By whom	SY SC	SY SC	SY SC	SY SC	SY SC	SY SC	SY SC	SY SC		SY SC	SY	SY SC

Meeting number	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Number of explicit references to ZeroOne	3	5	3	8	3	2		3
Explicit reference to next vessel(s)	1							1
By whom	SY	SY SC	SY SC	SY SC	SY	SY SC		SY SC

SY = Shipyard
SC = Subcontractor

Learning success #1: Increase in shipyard's coordination capacity

The shipyard managed to improve both inter- and intra-organizational coordination on ZeroTwo by increasing coordination capacity (see Table 4.4). On ZeroOne, the shipyard's project manager dealt with communication to the end customer – which was very time-consuming – but he also led the project meetings with the subcontractors. On ZeroTwo, the project manager dealt solely with the end customer, which gave him more time to efficiently

deal with (changing) customer preferences. Also, the shipyard's assistant project manager on ZeroOne became the second project manager on ZeroTwo. In this new role he led the project meetings, building on his experiences on ZeroOne. These experiences enabled him to better monitor and coordinate the actions of the various subcontractors. Furthermore, the shipyard's person dealing with material coordination on ZeroOne became the project management assistant on ZeroTwo. Finally, the number of shipyard production supervisors increased from one supervisor on ZeroOne to two supervisors on ZeroTwo, while an additional purchasing employee was placed on ZeroTwo to support the production supervisors as well. Because of all these changes, the number of people involved in coordination activities increased, enabling the shipyard to better monitor the end customer, the subcontractors and shipyard's own production personnel.

TABLE 4.4

Changes in shipyard's coordination capacity

ZeroOne	**ZeroTwo**
Project manager	Project manager 1
Assistant project manager	Project Manager 2
Production supervisor	Assistant project manager
Material coordination	Production supervisor 1
	Production supervisor 2
	Material coordination
	Additional purchaser
Total coordination capacity: 4	**Total coordination capacity: 7**

The increase in coordination capacity was initially driven by the experiences of the coordinators on ZeroOne, especially of the production supervisor and the project manager. They experienced severe levels of time pressure during ZeroOne:

"I used to leave work every day at 5 o'clock, have dinner, and be busy with our children until they slept at around 7.30 PM. Then I would spend the rest of the evening preparing work for the next day. When you come to think of it, that was complete madness. So at the end of ZeroOne I went to our production director and told him that if things on ZeroTwo would be the same, he could start looking for another production supervisor." [Production supervisor Shipyard]

The shipyard's production supervisor and project manager discussed their concerns with each other during ZeroOne in informal bilateral discussions and internal meetings, and also with the shipyard's production director. Thus, their accumulated experiences were accompanied by knowledge articulation activities as well. Still however, the decision to increase coordination capacity was not theirs to make. That decision was in the hands of the production director. The production director was only indirectly involved with the project. The production director gave permission to increase coordination capacity because he believed it would be worth the size of the investment. The shipyard lost a lot of money on ZeroOne. Increasing coordination capacity would initially increase costs, but a more efficient distribution of coordination tasks could lead to a more efficient production process and hence decrease overall costs.

In this example, persons directly experiencing the problem (i.e., project manager, production supervisor) were not the persons in the position to do something about it (i.e., production supervisor). Although that could have made actual change difficult, change did occur because the two parties both had an incentive to change. Both parties wanted – although for somewhat different reasons (work overload and profitability) – to increase coordination capacity. It seems then that because the change incentives of the two parties were aligned, change did come about.

Learning success #2: Improved planning

Many parties, both on the side of the shipyard and on the side of the subcontractors, indicated that compared to ZeroOne, the overall planning on ZeroTwo – as monitored and communicated by the shipyard – improved significantly on ZeroTwo. During ZeroOne, there was only little time between the finishing of major compartments. There were hardly

opportunities to adjust planning if a major compartment like the engine room was not finished according to schedule, because the following major compartment was already waiting in line. As a consequence, ZeroOne participants experienced high levels of time pressure. This created high stress levels among them. On ZeroTwo, the planning had changed in a way that there was more time between completions of major parts of the ship. A related improvement concerned the communication about the planning to the subcontractors, which was considered much clearer. Now everyone was better aware of which parts of the ship had to be finished when. The improved planning on ZeroTwo was driven initially and for an important part by the experiences of the shipyard on ZeroOne:

"Compared to ZeroOne, planning is a major improvement on ZeroTwo. It is now much clearer for everyone on board when things need to be ready. Also, we try to look ahead better, and this is possible because we know more or less what is coming." [Project manager Shipyard]

During ZeroOne, shipyard personnel discussed planning issues via informal discussions. Planning was also discussed, and considered a major point of improvement, during the shipyard's internal meetings. Some subcontractors also shared their concerns with the planning with the shipyard's (assistant) project manager, via informal conversations or during the project meetings. Comparable to the first example, this second example then shows a combination of experience accumulation and knowledge articulation processes. The shipyard wanted to improve planning in order to reach a more efficient production process in terms of for example fewer waiting hours and less rework. Waiting hours represent time in which project members cannot continue their work because they have to wait on others. Rework concerns destroying or disassembling finished work in a room because other disciplines need to carry out a task in that same room, and then reproducing or reassembling the work. Repairing was needed for example when the shipyard needed to execute welding activities in a finished room. The reworked part then needed to be isolated and painted again.

The important difference with the first example was that, at least from a shipyard perspective, the people experiencing the problems were the same people in the position to do something about it. The responsibility for change did not lie with 'external' parties, making change more likely to occur. Thus, experience accumulation and knowledge articulation led to cross-TO learning and adapted planning and production processes (or, change) because the persons experiencing the problem on ZeroOne were also the persons in the position to do something

about that problem on ZeroTwo. The situation was slightly different for subcontractors. From a subcontractor's perspective, there was an external party (i.e., the shipyard) responsible for changing the planning. In this example, the change incentives of the subcontractors and the shipyard were aligned: all parties pursue an improved planning as it eases the organizing of their work. So from a subcontractor's point of view, cross-TO learning occurred because their change incentives were in line with the shipyard's change incentives.

Learning success #3: More efficient interorganizational coordination of production

Most participants indicated that, compared to ZeroOne, the production process was much more efficient. This efficiency is different from the improved planning in the previous example, and is not merely a consequence of the first two learning successes. The improved planning was solely a shipyard matter, concerning especially the planning of compartments. The efficiency referred to in this example is about the efficiency of individual subcontractors and shipyard employees, about how they organize their work given the overall planning. Participants indicated that they recognized in advance situations that had gone wrong on ZeroOne, enabling them to tackle problems beforehand, before they actually surfaced. This accelerated the production process because they knew what was coming, making it possible to organize work more efficiently, for example by changing the sequencing of activities. As a consequence, participants faced less waiting hours and needed to carry out less rework. The more efficient production process was a direct consequence of the experiences of the subcontractors on ZeroOne:

"Because of our experiences on ZeroOne, we know what the showstoppers were. And now you recognize the showstoppers in advance and you know how you tackled that on ZeroOne, so that saves you a lot of time." [Production supervisor Piping subcontractor]

This third example shows the importance of having the same organizations (and the same individuals as well) involved in subsequent TOs. It enabled subcontractors to take their experiences with them from ZeroOne to ZeroTwo. Similar to the second example, the people experiencing the problems and the people in the position to do something about them were the same. What is different here though is that the shift from experience accumulation during ZeroOne to the application of these experiences during ZeroTwo did not require activation of additional learning mechanisms like knowledge articulation. The change occurred more or less automatically. This suggests that under the right conditions experience accumulation in itself can be a sufficient mechanism to bring about change across TOs.

The previous shows that in some instances learning between ZeroOne and ZeroTwo did take place. However, ZeroTwo participants indicated that in other instances learning between the two projects did not occur. They experienced two major problems on ZeroTwo that had already been problems on ZeroOne: one subcontractor failed to improve its intra-organizational collaboration process, and generally parties witnessed an increase in repair work. We discuss for each failure separately what the failure entailed, which learning mechanisms were involved, and the conditions which made these learning mechanisms ineffective.

Learning failure #1: Failure to improve intraorganizational collaboration process

One of the subcontractors' production supervisors experienced on both projects serious problems concerning internal collaboration. He felt he did not get any support from 'the office', i.e., his engineering department and executives. According to the production supervisor, the engineers were always late with providing information and delivering materials. He needed that information in order to properly plan and execute the work on board. Also, he felt no back-up from his executives when facing difficult decisions. Because information and materials were delivered late, the production supervisor could not continue work on board at the desired pace, and this had consequences for the other parties working on board as well. The shipyard's assistant project manager on ZeroTwo concurred with the production supervisor and explained that the internal problems on the side of this subcontractor were among one of the most important causes for delay on ZeroTwo. The production supervisor explained that this has been a problem for several years, and that this was not only a problem on ZeroOne and ZeroTwo but on other vessels as well.

At the end of ZeroOne and before the start of ZeroTwo, in an attempt to change this, the production supervisor arranged a meeting with his engineering department to discuss their issues. During that meeting the engineers explained that they were re-structuring internal processes. This restructuring took a lot of time, and because of this back-up had not always been sufficient. They said to understand the problems of production personnel and promised to change things. Yet, during ZeroTwo, the same problems arose, indicating that although processes of experience accumulation and knowledge articulation took place, learning across the projects did not.

Respondents came up with various explanations why change did not occur. The subcontractor, by order of the shipyard, also sent containers with material packages to foreign

production sites. The subcontractor's production supervisor claimed that his company earned much more money with those activities than with doing work on regular vessels. Consequently, they would put more effort in delivering containers on time to foreign countries than in providing information and materials timely to their production personnel. According to the shipyard's assistant project manager, a former employee of the subcontractor, their behavior did not change because they were not punished for it by the shipyard. He explained that as preferred and relatively cheap subcontractor, they would be selected on upcoming projects anyhow. This expectation of future interaction was also fueled by the fact that the shipyard and subcontractor had been doing business together for a very long time.

Similar to the learning success of increased coordination capacity, in this example the responsibility to change lay with an actor external to the project, namely the subcontractor's office. The explanations given suggest that an important reason why change did not occur was the absence of change incentives on the side of this office. Whether driven by the expectancy of future assignments no matter what, or by a primary focus on other activities such as sending material packages or restructuring internal processes, the office was unmotivated to improve collaboration with its production personnel. Thus, despite the activation of experience accumulation and knowledge articulation, cross-TO learning did not occur because the learning incentives of internal and external actors were not aligned.

Learning failure #2: Increase of repair work

A recurring problem on ZeroOne and ZeroTwo was that participants needed to do a lot of repair work. This finding seems in conflict with the second learning success, where the case is made that repair work decreased because the production process was more efficient. Indeed, on the one hand parties knew what was coming, so that they made fewer mistakes and less rework was needed. However, on the other hand ZeroTwo participants indicated that they were facing more repairing work than on ZeroOne. ZeroTwo participants expressed that the latter outweighed the former, so that altogether repair work on ZeroTwo increased in comparison to ZeroOne. The accumulation of experiences from ZeroOne apparently was not sufficient to facilitate learning across the projects. This shows that, comparable to the first learning failure, parties' learning experiences during one TO do not necessarily result in improvements on the next TO.

This apparent inability to learn turned out to be caused by the late involvement of the end customer on ZeroTwo. Respondents explained that on ZeroOne, the end customer already was known when production started. On ZeroTwo, production already started before the end customer was known, and before engineering had started with the detailed drawings. The decision to start production in advance was made by the shipyard's higher management. It enabled the shipyard to deliver ZeroTwo on relatively short notice, which was an important element of the shipyard's sales strategy. For customers who can afford it to buy luxury yachts, money is not that much of a problem. Short delivery time can then become an important factor in selecting a shipyard. Because of the decision to start production early, many adjustments had to be made with the entrance of the customer, who requested changes so that the end product would meet his preferences. This resulted in a lot of rework for all participants.

In this example too, the people experiencing the problems were not in the position to do something about it. Responsibility for change lay with shipyard's higher management, who could have decided not to start production until the end customer was known and until customer preferences were mapped. Financial interests made them decide otherwise, so that production personnel had no option but to deal with the situation. Also similar to the first learning failure then, the unaligned change incentives of internal and external actors frustrated cross-TO learning.

4.4.3 Integration of findings

If we now analyze the learning successes and failures from a theoretical point of view, we propose that there are two interacting conditions under which learning across TOs succeeds or fails: locus of change responsibility and alignment of change incentives. Locus of change responsibility refers to the actor who is responsible or able to make change happen. When an actor experiencing problems during one TO is also in the position to apply what he has learned during a subsequent TO, we speak of an internal change responsibility. In this case, an actor is not dependent on others to implement what he has learned. If an actor who is experiencing problems is dependent on other actors to prevent these problems from happening in a future TO, we speak of an external change responsibility. An external change responsibility increases the complexity of cross-TO learning because multiple actors are involved with the implementation of what has been learned. We suggest that in such cases, the alignment of change incentives of the actor experiencing the problems and of the actor in the

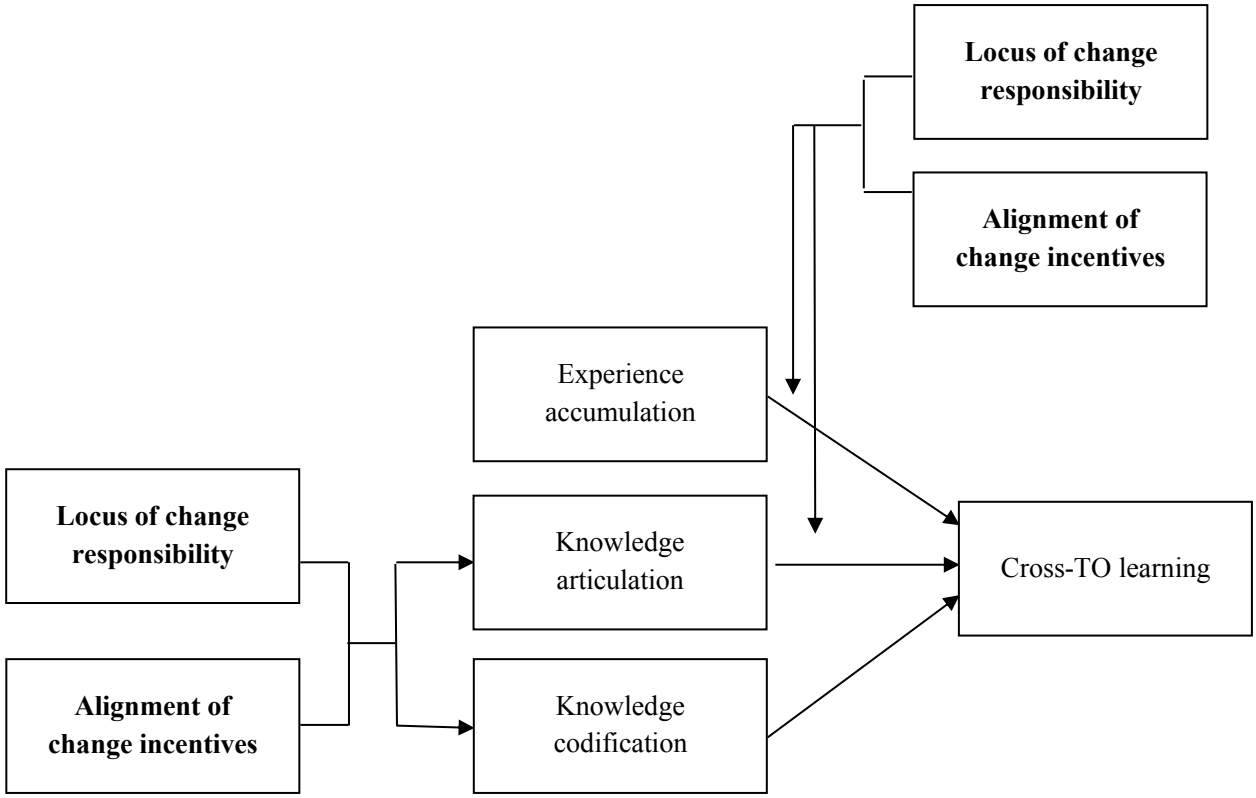
position to do something about these problems becomes important as well. Alignment of change incentives refers to the extent to which these actors are equally motivated to implement change. The larger the difference between these motivations, the less aligned are the actors' change incentives, and the less likely it becomes that change across TOs actually occurs.

The effectiveness of experience accumulation and knowledge articulation is, therefore, contingent upon the conditions of locus of change responsibility and alignment of change incentives. These learning mechanisms are unlikely to result in change across TOs when there is an external change responsibility in combination with unaligned change incentives. These two conditions also have direct negative effects on knowledge articulation and codification: they lower the chance that articulation and codification occur in the first place.

The discussed learning successes and learning failures are mainly driven by two learning mechanisms, i.e. experience accumulation and knowledge articulation. Knowledge codification occurred relatively infrequently. The shipyard's engineering department preferred that production personnel built according to the drawings, something which was also communicated by engineering. The only things that were 'drawn-as-built' were drawings which had not been worked out in detail because of time or money constraints. This had the consequence that the shipyard spent only little time in codification activities. On the side of the carpenter, more time was spent on the updating of drawings. The carpenter's production supervisor explained that he benefitted from these codification activities while working on ZeroTwo. Importantly, he expressed this was efficient because for them many compartments were the same. In line with this, the shipyard's project manager told that codification in the form of updated drawings was only effective once subsequent vessels were more or less the same. This suggests that the effectiveness of codification increases to the extent that subsequent TOs are similar in terms of the characteristics of the task. A schematic overview of the central findings can be found in the figure on the next page, which will be further discussed in the Discussion and conclusion section.

FIGURE 4.2

Theoretical framework of cross-TO learning



4.5 Discussion and conclusion

Our findings suggest several theoretical contributions. First, we contribute to the ongoing learning debate by suggesting two major conditions under which cross-TO learning fails or succeeds: locus of change responsibility in combination with alignment of change incentives. When taking into account these conditions, we can reconsider what has been labeled the learning paradox (Bakker et al., 2011b). This paradox accentuates the dispersion of knowledge when TOs come to an end and participants disband. It considers limited duration and subsequent time pressure as the most important barriers to cross-TO learning. But limited duration is less relevant for learning when the same organizations and individuals are involved across TOs, because knowledge does not disperse. These shadows of the past and future open up the possibility of effective experience accumulation so that any negative effect of TOs' limited duration is mitigated (Larsson et al., 1998; Makhija & Ganesh, 1997; Swan et

al., 2010). Experience accumulation also tackles the possible problem of lack of absorptive capacity of participants (Tsai, 2001) and decreases the time needed to search for relevant information (Bartsch et al., 2013). Therefore we suggest a reconceptualization of the learning paradox: the involvement of multiple organizations provides ample (cognitive) learning opportunities, but the same multi-party involvement decreases the probability that actual (behavioral) learning will occur when participants have unaligned change incentives (Medlin, 2006), even if across TOs the same organizations and individuals are involved. In addition, our findings imply that unaligned change incentives do not only apply to interorganizational levels of analysis, but also to intraorganizational levels. The interorganizational learning literature points mainly at the problem of having to integrate the needs of the various organizations, but bringing together the needs of various internal departments within one organization can be equally troublesome.

Second, we extend the notion of incentive alignment to the area of cross-TO learning. Literature on multi-organizational collaboration addresses the complexity of having multiple organizations involved which can have different incentives (e.g. Medlin, 2006; Sommer & Loch, 2004). In intraorganizational settings, incentive alignment is described as the extent to which individuals are motivated to behave in line with organizational goals (Gottschalg & Zollo, 2007). Literature on alignment of incentives in the context of interorganizational collaboration that we have come across does not specifically focus on learning across TOs. For instance, in the context of buyer-supplier relations incentive alignment has been described as the extent to which parties share costs, risks, and benefits (Simatupang & Sridharan, 2002). Incentive alignment is considered to increase the chance that organizations or individuals focus not solely on pursuing their own interests but also consider the interests of others (Simatupang & Sridharan, 2002). It is portrayed as an important condition for the transfer of knowledge between organizations, for the prevention of opportunism, and for realizing competitive advantage (Dyer & Singh, 1998: Kale, Singh, & Perlmutter, 2000, Tosi, Katz, & Gomez-Mejia, 1997). Complementing these ideas, we show that incentive alignment not only facilitates cognitive learning in the form of knowledge sharing, but also actual change across TOs, or behavioral learning.

Third, we contribute to the literature on organizational ability and willingness. Ability and willingness have been identified as major predictors of knowledge sharing between organizations (e.g., Reagans & McEvily, 2003), but to a much lesser extent as predictors of actual cross-TO learning. Locus of change responsibility refers to an actor's ability to

implement changes. Ability is often connoted with cognitive aspects, for example in terms of absorptive capacity (Tsai, 2001). We show that ability also relates to a different, behavioral type of ability. Alignment of change incentives influences an actor's willingness to bring about change. The identification of willingness as an important enabler to cross-TO learning suggests a need to consider motivational aspects of temporary interorganizational collaboration (cf. Gottschalg & Zollo, 2007).

Theoretically we can explore four scenarios based on the extent to which the two identified conditions are present. We propose that the probability of cross-TO learning differs per scenario (see Table 4.5). First we discuss the two scenarios in which there is an internal change responsibility. This means that the actor who experiences the problems – who cognitively learns something during one TO – can independently tackle these problems and implement what he has learned during subsequent TOs. Because there is an internal change responsibility, the actor is able to implement the change, making the willingness of others to implement the change less relevant. Still there can be a difference in the extent to which other TO participants agree or disagree with the implemented change, or the extent to which they are positively or negatively affected by it. In Scenario 1, change incentives are aligned, meaning that other parties are not negatively affected by the implementation. In Scenario 2, these incentives are not aligned. We assume that TO participants because of their interdependence will not solely pursue self-interests but also act to achieve the common goal. Based on this assumption, we propose that in the first scenario (internal change responsibility in combination with aligned change incentives) the probability of cross-TO learning is higher than in the second scenario (internal change responsibility in combination with unaligned change incentives).

In contrast, TO participants can face an external change responsibility. Here, TO participants are dependent on others to implement what they have learned during previous TOs. In the case of external change responsibility, alignment of change incentives becomes more important than in the first two scenarios. These incentives can be aligned (Scenario 3) or misaligned (Scenario 4). When the change incentives of the internal and external actors are aligned, for the most part the change objectives and intentions are similar. This increases the probability that change will be implemented because both parties share a willingness to change. Still, we believe that the probability on cross-TO learning in this scenario is slightly lower than in the first scenario because of the necessary involvement of an external actor which can lead to among others coordination problems. At the same time we believe the

probability to be higher than in the second scenario. That is because we believe that the alignment of change incentives is more important in enabling cross-TO learning than whether there is an internal or an external change responsibility. In the fourth scenario, change incentives of the two different types of actors are not or only weakly aligned. Here, the probability of implementation of what has been learned previously will be lowest in comparison to the other three scenarios. After all, actors are dependent on others to implement changes, but these others do not share the willingness to do so.

TABLE 4.5

Learning scenarios

	Strong alignment of change incentives	**Weak alignment of change incentives**
Internal locus of change responsibility	Scenario 1: Highest probability of cross-TO learning	Scenario 2: Low probability of cross-TO learning
External locus of change responsibility	Scenario 3: High probability of cross-TO learning	Scenario 4: Lowest probability of cross-TO learning

As final theoretical contribution we suggest rethinking the importance of experience accumulation for cross-TO learning. In line with other research, we show that experience accumulation is a, if not the most, dominant mechanism for the implementation of changes (Bartsch et al., 2013; Swan et al., 2010). This means that having the same organizations and individuals involved across TOs facilitates cross-TO learning. However, there is also a dark side to reliance on the same actors (Uzzi, 1997), which becomes visible when actors repeatedly fail to implement desired changes across TOs. As actors experience time after time that these desired changes are not implemented, they can arrive at a point where they no longer search for improvements, but accept the situation as is:

"We know upfront that when we start a vessel with subcontractor X, materials will be late which will frustrate the process. And we know that we will have battles, and that the

executives have to come in to settle the conflict. But we have to put up with it, because on a next vessel they will be selected again anyhow." [Project management assistant Shipyard]

The above is an example of a situation where, despite cognitive learning, actors no longer search for opportunities to implement what they have learned but instead accept the situation as is. We believe this 'learning resignation' is a consequence of the repeated experiencing of failure to implement change. Thus, on the one hand experience accumulation can be an important mechanism to facilitate cross-TO learning. But it can also frustrate cross-TO learning, which will occur especially when TO participants repeatedly face external change responsibility in combination with unaligned change incentives.

Following the theoretical implications, the most evident practical implication is that organizations participating in TOs should try to align their change incentives. That is also because in a multi-organizational context, the implementation of changes often is dependent on multiple actors, meaning that an external change responsibility will be more frequently present than an internal change responsibility. Incentives can be aligned formally, for instance by the use of equity arrangements (Kogut, 1988). However, it is stressed in the literature that it can be also effective to rely on personal trust or reputation mechanisms (Uzzi, 1997). Lead organizations – being in the position to select their partners – therefore seem to do wise to rely on the same set of partner organizations. This opens up the possibility of the transfer of valuable, tacit experiences across TOs so that knowledge is unlikely to dissipate. As a consequence, this increases the probability that changes across TOs are actually implemented. However, a possible downside of this strategy could be that partner organizations put less effort in being an optimal collaboration partner when they know they will be selected on upcoming projects anyhow. Similarly, partner organizations – who are no lead organizations – may wonder if they want to take assignments from the same lead organization over and over again. This makes them highly dependent on one or a few lead organizations and may result in continuous suboptimal collaboration, especially when the change incentives of partners are and remain diverging.

There are a number of limitations to this study which may be addressed in future research. Of course, the generalizability of the results is limited. We study the specific context of shipbuilding and that of yachting vessels. Yet we expect the findings to apply to similar project-based industries like construction. In construction too, a lead organization and several subcontractors act together to produce a tangible product in a limited amount of time, and

learning is not the main objective. It would be interesting to address in future research whether our findings also apply to settings which are non-temporary, learning-driven, which produce intangible services and/or which are comprised of only two instead of three or more organizations. Generalizability is further limited because our one-case examination (we consider ZeroOne and ZeroTwo to be one case of cross-TO learning) does not allow for cross-case comparison. The majority of participants were involved in both ZeroOne and ZeroTwo, making it difficult to disentangle a possible effect of varying configuration of individuals (i.e., not having the same participants across the two projects). Future research could simultaneously examine and compare multiple cases in order to make stronger claims about the factors that facilitate or hamper cross-TO learning.

Another limitation concerns the possibility of interpretation bias on the side of the researchers concerning the results from the observations and interviews. Both data collection methods run the risk that the interpretation of what is heard or observed does not adequately reflect the perceptions and interpretations of the project participants. We have tried to overcome this problem by triangulation of the data and results and by discussing our findings with the respondents. Then there is a possible recall bias on the side of the respondents, where they could be more willing to share success stories and hide their failures. However, as the results show, also learning failures have been expressed and identified, suggesting that this bias probably is limited.

Content-wise a limitation is that the learning mechanisms are not equally represented in the analysis. The participants predominantly engaged in experience accumulation and knowledge articulation, while knowledge codification activities were limited. This makes it difficult to say something about under which conditions codification can facilitate cross-TO learning. Zollo and Winter (2002) argue that the effectiveness of codification gets higher as the heterogeneity or uniqueness of the task increases. However, we think this largely depends on the type of knowledge that is codified. In the TOs under study, codification in terms of the updating of technical drawings was very limited, because ZeroTwo differed significantly from ZeroOne. So, contrary to Zollo & Winter's argument, we can make the case that task uniqueness lowers the value of knowledge codification. Future research could explicitly address the conditions that make codification effective, which may be different than locus of change responsibility and alignment of change incentives, and also which may be dependent on the type of knowledge codified.

Finally, we look at learning from the perspective of problem-based learning: TO participants experience problems and discuss them during one TO, which then can or cannot result in the implementation of solutions to these problems in a subsequent TO. This reflects predominantly learning-by-doing and learning-by-discussion, but there are other types of learning as well like learning-by-absorption, or superstitious learning (Levinthal & March, 1993; Zollo, 2009). Future research may address other learning perspectives when defining and identifying learning across TOs to see if the identified conditions of this study still hold.

In conclusion, this study set out to enrich the (inter)organizational learning literature in the context of temporary organizing. Our exploration of the conditions under which learning across TOs fails or succeeds, gives us a better view of TO amnesia, organizations seeming inability to implement change across TOs. It turns out that the failure to implement change across TOs is not a matter of amnesia. After all, TO participants do not 'forget' what they have learned during previous TOs, either via experience accumulation, knowledge articulation, or knowledge codification. They know what needs to be changed to come to improvements, but they are not in the position to make these changes (external change responsibility), while the ones who are in this position do not have the willingness to change (unaligned change incentives). All this underlines the difficulty and complexity of learning across TOs in which multiple organizations and individuals are involved, which therefore remains a formidable challenge.

5. Disentangling interorganizational and interpersonal ties and their effect on coordination and safeguarding: A theoretical exploration

5.1 Introduction

The temporary involvement of multiple organizations creates challenges with regard to coordination and opportunism, due to among others managerial complexity and the possibility of self-interest seeking organizations (Glückler & Armbrüster, 2003; Jones et al., 1997; Medlin, 2006). To deal with these challenges organizations can strive for repeated collaboration with the same partners (Jones et al., 1997). There is consensus in the literature that prior ties (i.e., shadows of the past) and expected future ties (i.e., shadows of the future) facilitate coordination and prevent opportunism in a current TO (Eccles, 1981; Grabher, 2002b; Parkhe, 1993). However, this literature largely ignores the distinction between ties between *organizations* on the one hand and ties between *individuals* (as members of these organizations) on the other hand (Schilke & Cook, 2013; Zaheer, McEvily, & Perrone, 1998). This is problematic to the extent that interorganizational and interpersonal ties are different (Rousseau, 1985) and therefore vary in their effects on coordination and opportunism. For example, it can be argued that when a group of individuals has a history of collaboration but the organizations they represent have not, coordination is influenced in a different way or to a different degree than when these individuals have not collaborated before but the represented organizations have. Still, our knowledge on this matter is limited. How combinations of interorganizational and interpersonal ties play out in temporary interorganizational collaboration still remains an open question (Barden & Mitchell, 2007). This theoretical chapter addresses this question by systematically disentangling the effects of prior and future ties at the interorganizational and interpersonal level on coordination and opportunism in a current TO.

By taking into account interorganizational and interpersonal levels of analysis simultaneously we contribute to the TO literature by providing a more comprehensive view of the complexity of interorganizational collaboration (Hitt et al., 2007; Klein, Tosi, & Cannella, 1999; Schilke & Cook, 2013). We do this by adding a temporal dimension to the debate on the difference between interorganizational and interpersonal ties. Specifically, we propose that when it comes to enhancing coordination in a current TO, interpersonal prior ties are more influential than interorganizational prior ties. When it comes to preventing opportunism in a current TO

however, we propose that interorganizational future ties have a more decisive effect than interpersonal future ties.

The chapter is structured as follows. First we elaborate on the temporariness of TOs, making the case that TOs also have features that transcend their temporariness, for example in the form of shadows of the past and future. Next, we discuss the coordination and opportunism challenges in TOs, and how shadows of the past and future can deal with these challenges. Then we show the shortcomings of current literature in disentangling interorganizational and interpersonal prior and future ties and their effects on coordination and opportunism. In trying to overcome these shortcomings we propose definitions for interorganizational and interpersonal prior and future ties. Based on these definitions, we develop a typology of temporary organizations based on the presence or absence of interorganizational and interpersonal ties and discuss the implications for coordination and opportunism in each TO type.

5.2 Temporary and permanent features of temporary organizations

In temporary organizations, the duration of collaboration is "explicitly and ex ante fixed either by a specific date or by the accomplishment of a predefined task or condition" (Janowicz-Panjaitan et al., p. 2). This temporary nature is a unique feature that sets TOs apart from more commonly researched interorganizational collaboration types such as joint ventures or alliances, which are 'built to last' (Greve et al., 2010). TOs are fixed in time by a given starting point, which decouples the TO from past activities (Lundin & Söderholm, 1995). This is the so-called left-bracket of TOs. TOs also have a right-bracket as they have no future beyond their ex ante specified ending point (Bakker & Janowicz-Panjaitan, 2009). The activities in TOs take place between these temporal limits (Sydow & Staber, 2002).

However, TO participants often collaborate repeatedly with the same partners (Jones & Lichtenstein, 2008; Skilton & Dooley, 2010). In industries like architecture and construction repeated collaboration is the norm instead of the exception (Eccles, 1981; Levering et al., 2013). When organizations collaborate repeatedly with the same partners, relations become socially embedded and transaction costs are lowered (Dyer & Chu, 2003; Granovetter, 1985). These relationships form what have been called latent networks: "forms of organization that bind together configurations of key actors in ongoing relationships that become active/manifest as and when new projects *[or TOs]* demand" (Starkey et al., 2000, p. 299). In the context of TOs, repeated collaboration consists of two elements: participants may have

collaborated before in previous TOs and they may expect to work together again in future TOs. Prior ties between TO participants indicate social embeddedness, i.e. a shadow of the past (Jones & Lichtenstein, 2008; Poppo et al., 2008). Expectations of future interaction suggest a shadow of the future (Axelrod, 1984), which has also been referred to as long-term orientation or the extendedness of relations (Ganesan, 1994; Poppo et al., 2008; Rokkan, Heide, & Wathne, 2003). Recurring relations among TO participants run counter to the ideal-typical view that temporary organizations are one-off, unique and discontinuous (Edmondson & Nembhard, 2009; Gann & Salter, 2000; Prencipe & Tell, 2001) and that TO participants only "cope with immediate demands and simultaneously forget the past and neglect plans for the future" (Miles, 1964, p. 130). Instead, by taking into account shadows of the past and future, temporary collaboration is building on a more permanent set of relationships, which might have implications for the behavior of TO participants.

5.3 Coordination and opportunism challenges in temporary organizations

The coordination and opportunism challenges in TOs stem from the temporary involvement of multiple, legally independent but functionally interdependent organizations (Sydow & Staber, 2002). The coordination challenge concerns the integration of complex, interdependent tasks executed by a group of specialists (Alter, 1990; Jones et al., 1997). These specialists are dependent on each other because they are simultaneously involved in the project and often one cannot proceed until others are finished (Eccles, 1981). Next to this sequential interdependence, there can be reciprocal interdependence, meaning that participants need to interact on a continuous basis, receiving input from and providing output to each other, to accomplish their tasks (Thompson, 1967). Due to the interdependent nature of jointly producing products and services, multi-party involvement creates managerial complexity as well as uncertainty (Glückler & Armbrüster, 2003; Parkhe, 1993). The challenge of opportunism basically refers to balancing private and collective interests (Medlin, 2006), and to dealing with the possibility of working with others who are seeking self-interest with guile by engaging in or refraining from particular actions (Medlin, 2006; Wathne & Heide, 2000; Williamson, 1979). This possibility of participants engaging in free-riding and engaging in behaviors at the expense of others further increases the complexity of interorganizational temporary collaboration (Das & Teng, 2002; Kogut, 1988; Provan, 1993; Santoro & McGill, 2005). Next to the involvement of multiple organizations, the temporary nature of TOs can have consequences for coordination and opportunism (Raab et al., 2009; Turner & Müller, 2003). Limited TO duration may for example hinder the stabilization of

social interaction, thereby increasing the need for coordination efforts (Raab et al., 2009). Furthermore, limited duration can imply that TO participants will not collaborate in the future, thereby increasing the rewards of – and thus the chance on – opportunism in the present (Turner & Müller, 2003).

Dealing with the challenges of coordination and opportunism is necessary to ensure that participants engage in collective and mutually supportive action, that conflicts are addressed, and resources are acquired and utilized efficiently (Mayer, 2006; Provan & Kenis, 2008; Wuyts & Geyskens, 2005). Working relationships in TOs are initially structured by means of formal contracts (Sobrero & Schrader, 1998; Weber & Mayer, 2011). Formal contracts specify organizations' promises and obligations to perform particular actions in the future (Macneil, 1980) and contain procedures for monitoring and conflict resolution (Poppo & Zenger, 2002). Through these properties, contracts can facilitate coordination and function as a safeguarding instrument against opportunism. However, the influence of contracts on collaboration in TOs is limited, among other things because contracts are always incomplete, and because often contracts are used only as a last resort to resolve problems and conflicts (Macaulay, 1963). In the light of these shortcomings, it has been argued that coordination and opportunism in TOs are predominantly influenced by the recurrence of relations among TO participants (Jones et al., 1997). Although TOs are fixed in time by a given starting-point and an ex ante defined termination point (Lundin & Söderholm, 1995), relations tend to recur and endure across TOs (Jones & Lichtenstein, 2008). Recurring relations can take the form of prior collaboration or expectations of future interaction, creating shadows of the past and future (Poppo et al., (2008). A vast amount of empirical research shows that as TO participants repeatedly work together they come to know and understand each other's roles, procedures, and preferences, which smoothens coordination (Eccles, 1981; Grabher, 2002b; Gulati, 1995; Levinthal & Fichman, 1988; Pisano, Russo, & Teece, 1988; Reuer & Ariño, 2007; Sydow & Staber, 2002; Uzzi, 1997). Repeated ties between TO participants also allow for the development of communication methods and other routines for working together more effectively (Bryman et al., 1987). In addition, when TO participants expect to collaborate repeatedly in the foreseeable future they are more inclined to refrain from opportunism than when these expectations are absent (Jones et al., 1997). Ongoing relationships generate a sense of obligation between TO participants which motivates them to behave in a trustworthy manner (Gulati, 1995; Uzzi, 1997). Thus, shadows of the past and future among TO

participants ease coordination and help preventing opportunism (Jones & Lichtenstein, 2008; Skilton & Dooley, 2010).

Despite their valuable contributions, previous studies on recurring ties and their effect on coordination and opportunism largely overlook the distinction between ties between *organizations* on the one hand and ties between *individuals* on the other hand (for exceptions, see Barden & Mitchell, 2007; Schilke & Cook, 2013; Zaheer et al., 1998). By ignoring the difference between interorganizational and interpersonal ties, these studies do not fully take into account the complex, multi-level nature of interorganizational collaboration.

5.4 A closer examination of the literature on repeated ties

In the following we demonstrate these shortcomings by a closer examination of the literature on repeated collaboration in an attempt to identify coordination-enhancing and opportunism-preventing mechanisms at interorganizational and interpersonal levels of analysis (for a schematic overview, see Table 5.1).

Interorganizational prior ties are argued to lead to shared understandings among organizations (Grabher, 2002b) as organizations become aware of each other's procedures and preferences. For example, organizations come to know about partners' operating procedures, technical skills, and managerial philosophies (Pisano et al., 1988). Also, through repeated collaboration organizations learn to work together as they develop communication protocols and other collaboration routines (Bryman et al., 1987; Eccles, 1981). This development of shared understandings and collaboration routines facilitates coordination (Grabher, 2002b; Pisano et al., 1988). Furthermore, prior collaboration facilitates the development of interorganizational trust, which in turn lowers the chance that organizations act opportunistically (Gulati, 1995). When two organizations also repeatedly collaborate with the same third parties over time, relations are not only relationally but also structurally embedded (Jones & Lichtenstein, 2008). This paves the way for the development of a macro culture, which is an accumulation of common values, norms and beliefs among multiple organizations (Jones et al., 1997). Such a macro culture enhances not only coordination but also prevents opportunism because of reputation effects (Das & Teng, 2002; Jones et al., 1997). In sum, interorganizational prior ties enhance coordination through familiarity, the development of collaboration routines, and – if relations are not only relationally but also socially embedded – the development of a macro culture. Interorganizational prior ties further lower the chance on opportunism through

the development of interorganizational trust and also through the development of a macro culture.

The literature on interpersonal prior ties seems to rest on similar arguments. Through prior interpersonal collaboration individuals share ideas across organizations and get familiar with each other, both of which facilitate coordination (Levinthal & Fichman, 1988). Prior interpersonal ties further facilitate coordination by increasing the willingness of individuals to share sensitive information (Zaheer et al., 1998). Next to its effect on coordination, repeated interpersonal collaboration lowers the chance on opportunism. Interpersonal prior ties tend to result in a trusting relationship between individuals (Granovetter, 1985; Uzzi, 1997). Interpersonal trust facilitates problem solving, courtesy and consideration (Currall & Judge, 1995; Williamson, 1975). It reduces the intensity of rivalry and instead promotes collective action (Abrahamson & Fombrun, 1994). All this makes it less likely that parties seek narrow advantage. Thus, interpersonal prior ties facilitate coordination through information sharing and familiarity. Interpersonal prior ties also make opportunism less likely through the development of interpersonal trust and because individuals are more inclined to take into account each other's interests.

Scholars ascribe more or less the same effects to prior interorganizational and prior interpersonal ties, like familiarity and trust development. That suggests, in line with our earlier comments, that the distinction between interorganizational and interpersonal ties is difficult to make. This difficulty seems a consequence of the inherently multilevel nature of interorganizational relationships (Brass et al., 2004): TO participants are individuals representing organizations (Schoorman, Mayer, & Davis, 2007). Barden and Mitchell (2007) note that scholars "have either constrained analyses to the interorganizational level without considering the roles of interpersonal ties (e.g., Gulati, 1995) or relied heavily on data provided by organizational leaders in a context in which individual-level and organization-level influences cannot be easily disentangled (e.g., Uzzi, 1997)."

TABLE 5.1

Overview of literature on the effects of interorganizational and interpersonal ties on coordination and opportunism

Prior ties		**Future ties**
Interpersonal level	*Interorganizational level*	*Interpersonal and (implicitly) interorganizational level*
Getting familiar with each other improves coordination (Levinthal & Fichman, 1988)	Through repeated ties organizations learn to work together (Eccles, 1981)	Tit-for-tat strategy, or reciprocal behavior, limits the change on opportunism (Axelrod, 1984)
Repeated personal interaction discourages efforts to seek narrow advantage (Williamson, 1975)	As organizations repeatedly collaborate, they learn each other's operating procedures, technical skills, and managerial philosophies, which improves coordination (Grabher, 2002b; Pisano et al., 1988)	The longer the expected future collaboration, the less likely is the chance on opportunism (Parkhe, 1993)
Prior ties tend to result in a trusting relationship (Granovetter, 1985; Uzzi, 1997)	Prior collaboration breeds trust (Gulati, 1995)	Opportunism is curbed when individuals expect future collaboration (Telser, 1980)

Also, while theorizing on the effects of interorganizational ties scholars often take the effects of interpersonal ties as point of departure. This leads to confusion and conflation (Barden & Mitchell, 2007). For example, the often-cited article by Gulati (1995) stresses that familiarity among exchange partners leads to trust in each other. Based on this premise and explicitly referring to the article, some scholars put forward that inter*personal* prior ties lead to trust

(e.g., Petruzelli, 2011), while others claim that the development of trust comes from inter*organizational* prior ties (e.g., Dyer & Singh, 1998). Thus, when it comes to theorizing on the effects of interorganizational and interpersonal prior ties on coordination and opportunism, there is ample room for improvement.

This room for improvement also applies to theorizing on interorganizational and interpersonal future ties. While prior ties have an influence on both coordination and opportunism, it seems that expectations of future interaction only influence opportunism. The expectation of future collaboration can induce TO participants to develop coordination routines, but the expectation of future ties in itself cannot enhance coordination of current interdependent tasks. In theorizing on the effects of future ties on opportunism, scholars rarely attempt to disentangle the interorganizational and the interpersonal level. Similar to theorizing on the effects of prior ties, scholars take the expectations of individuals as the point of departure, and extend these ideas to the level of organizations. Still, there seems to be consensus in the literature that the expectation to work together in the future lowers the chance on opportunism in the present (Axelrod, 1984; Parkhe, 1993; Telser, 1980). Future collaboration allows for reciprocal behavior: once future collaboration is expected, opportunism is a less attractive option because the damaged actor can 'return the favor'. The ongoing interaction allows for rewarding and punishing each other's behavior (Parkhe, 1993; Rokkan et al., 2003). Next to direct reciprocity, in a TO context – where multiple organizations collaborate – there is also generalized reciprocity (Das & Teng, 2002). This means that experiences are shared among multiple organizations, which in turn has an important influence on the reputation of these organizations (Eccles, 1981; Provan, 1993). To the extent that organizations care for their reputation, they will be eager not to be perceived as opportunistically, and take a collaborative stance. Thus, expectations of future ties lower the chance on opportunism through the mechanisms of reciprocity and reputation.

This short review of the literature on repeated collaboration might induce one to propose that there are no differences between interorganizational and interpersonal ties. However, we argue that this is not the case. The differences can best be illustrated by an example. Consider a current TO in which a focal group of individuals (representing different organizations) are working together to accomplish a task. This focal group shares no history of collaboration, but the organizations the group represents do. In this case, there are no interpersonal prior ties among the focal group, but there are interorganizational prior ties. These interorganizational prior ties in fact represent interpersonal prior ties *other* than those of the focal group.

Following this example, we define interorganizational prior ties as the collective of prior collaborative relations among the organizations which the individuals in the focal group represent, excluding the relations between the individuals in the focal group themselves (cf. Barden & Mitchell, 2007). Thus, in our perspective, these interorganizational prior ties are interpersonal relations between members of the collaboration organizations who are not members of the focal group. Furthermore, we define interpersonal prior ties as the collective of prior relations among the focal group in a current TO.

We apply the same principle to defining interorganizational and interpersonal future ties. Consider a current TO in which a focal group of individuals (representing different organizations) are collaborating with each other to accomplish the objectives of the TO. This focal group shares no expectations of future interaction with each other, but they do expect their organizations to collaborate in the future. In this case, there are no expected interpersonal ties, but there are expectations of interorganizational future collaboration. In line with this example, we define interorganizational future ties as the expectations of the individuals in the focal group that the organizations they represent will collaborate with each other in the future, but that they will not necessarily collaborate with the same individuals in the focal group. We define interpersonal future ties as the expectation of the individuals in the focal group to collaborate with each other in the future. Based on these definitions, in the next section we develop a typology of temporary organizations based on the presence or absence of interorganizational and interpersonal ties.

5.5 A tie-based typology of temporary organizations

To keep complexity within bounds we discuss one typology of TOs based on prior ties and another typology of TOs based on future ties.[13] This choice is further motivated by our assumption that prior ties predominantly influence coordination while future ties predominantly have an effect on opportunism. Table 5.1 suggests that future ties do not influence coordination in a current TO. Expected future collaboration could inspire TO participants to develop coordination routines which then can be put to use in the future. But the expectation to work together in the future in itself cannot enhance coordination of current interdependent tasks. This suggests that with regard to improving coordination, prior ties are probably more influential than future ties. With regard to preventing opportunism, the

[13] One typology based on prior and future ties at interorganizational and interpersonal levels would comprise no less than sixteen different TO types.

demarcation is more arbitrary because both prior and future ties may affect opportunism. However, recently it was suggested that future ties are more important for the development of trust than prior ties (Poppo et al., 2008). That is because prior ties promote interorganizational stability as parties develop collaboration routines, which in turn increases expectations of continuity. Since trustworthy behavior can be considered the opposite of opportunism (Sako & Helper, 1998), we argue that future ties are more important for the prevention of opportunism than are prior ties.

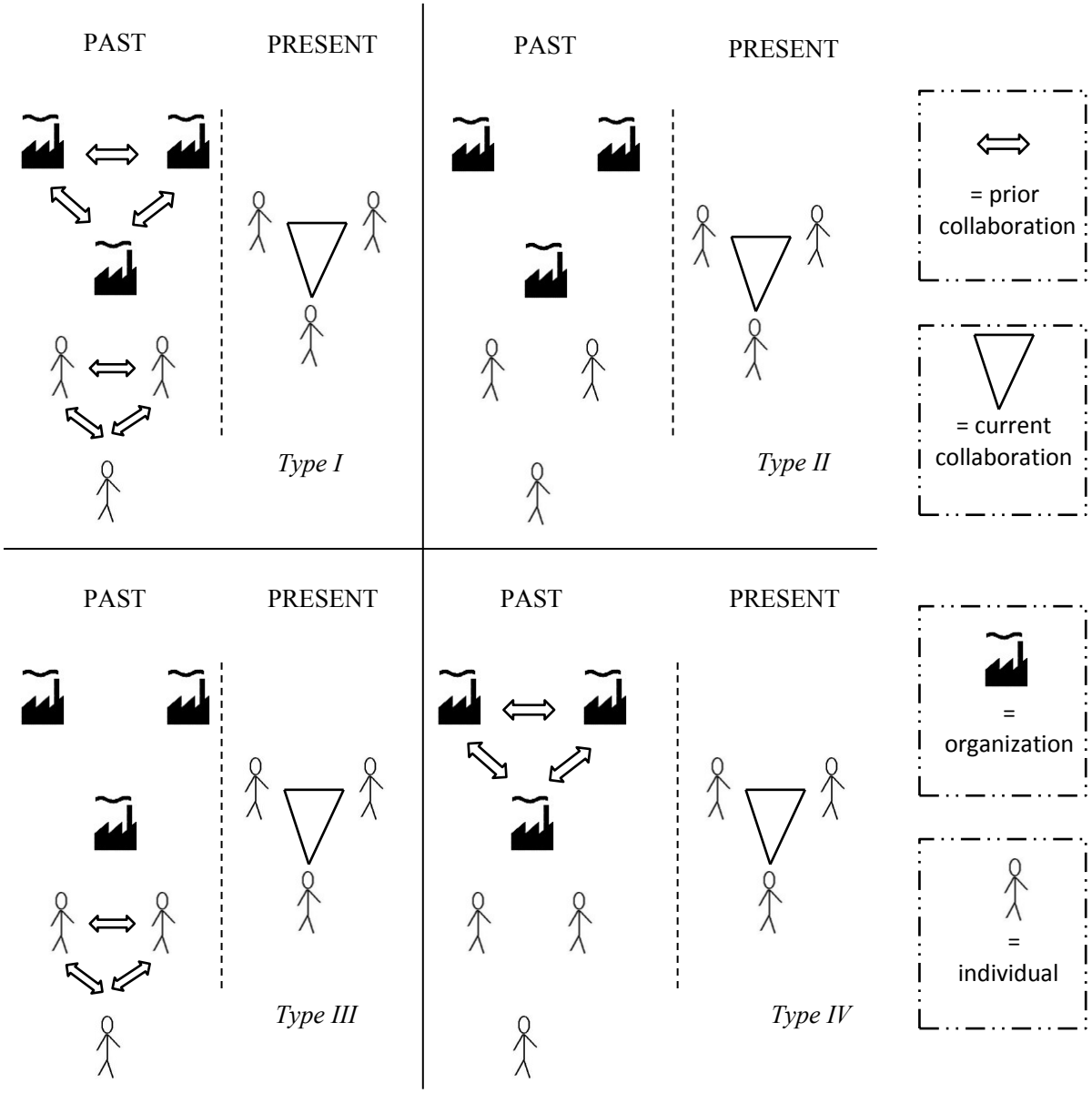
Furthermore, in each typology we discuss a different type of focal group based on the type of boundary spanners involved. Interorganizational relationships in TOs are actively managed and dealt with by individual boundary spanners (Katz & Kahn, 1966). We can distinguish between corporate-level boundary spanners and operational-level boundary spanners (Janowicz-Panjaitan & Noorderhaven, 2009). Operational-level boundary spanners have close and intense interaction with their organizational counterparts. The coordination of interrelated tasks therefore seems especially relevant at an operational level. Because of this, we discuss the effects of interorganizational and interpersonal prior ties on coordination at the level of the operational boundary spanners. These operational-level boundary spanners do not decide on possible future collaboration. That task is dealt with by corporate-level boundary spanners. As corporate-level boundary spanners decide on future collaboration, they are probably more affected by expectations of future interaction than operational-level boundary spanners. Because of this, we discuss the effects of interorganizational and interpersonal future ties on opportunism at the level of the strategic boundary spanners. Another important reason for this demarcation is that we – as we will discuss – argue that the relative importance of interorganizational and interpersonal ties varies with the type of boundary spanners considered.

First we develop a typology of TOs based on the presence of interorganizational and interpersonal prior ties (for a schematic overview, see Figure 5.1). This typology enables us to further explore the differences between the individual and organizational level of analysis. We explore four ideal-typical TOs. In each TO type we are interested in the ease with which the focal group (consisting of operational-level boundary spanners) coordinates its activities. This exploration provides possible answers to some important theoretical questions. For example, when will coordination be easier: when the focal group shares no history of collaboration but the organizations they represent do, or when the opposite is true? And how easy or difficult is

coordination once both the focal group and the organizations they represent share no prior ties at all?

FIGURE 5.1

A typology of TOs based on prior ties



Type I

In temporary organization type I, the focal group has collaborated with each other before, and so have the organizations represented by the focal group. That is, the focal group is linked through interpersonal prior ties, in addition to the presence of interorganizational prior ties. Situations like this are likely to occur in relatively small professional communities where there is little room to switch among TO partners, and where the organizations are relatively small in size. That makes it likely that when organizations repeatedly collaborate, also the same individuals are involved. Based on the earlier identified mechanisms, the presence of interorganizational and interpersonal prior ties will improve coordination for the focal group in a number of ways. The individuals in the focal group are likely to have developed trust relationships, which in turn should have led to information sharing and the development of collaboration routines. The interorganizational prior ties can create a macro culture which further facilitates coordination. We expect the mechanisms activated by the interorganizational and interpersonal prior ties to reinforce each other, so that coordination in this combination is most effective compared to the other three TO types.

Type II

While type I TOs are one extreme in the sense that both the focal group and the organizations they represent share a history of collaboration, type II TOs represent the other extreme. In this TO type, neither the individuals in the focal group nor the represented organizations share a history of collaboration. This situation would represent one side of the ideal-typical TO, where there are hardly any shadows of the past (Goodman & Goodman, 1976; Miles, 1964). It would occur when organizations – in a search for the creation and transfer of new knowledge (Dodgson, 1993), the employment of innovative activities, or after dissatisfaction with previous partners – turn to organizations they have not collaborated with before. In this situation it is likely that the individuals also share no history of collaboration. In this TO type the focal group has not had the chance to develop specific collaboration routines. Also, there are no interorganizational collaboration routines developed by others so they cannot rely on them either. The only basis for coordination is formed by the prior experiences of each individual member of the focal group with collaboration with other organizations and individuals. Because of this, coordination in this TO type is expected to be least effective compared to the other types.

Type III and type IV

We discuss type-III and type-IV TOs simultaneously because they can be considered opposites. In type III, the individuals in the focal group share a history of collaboration, but the organizations they currently represent do not. One could imagine this to happen when professionals that carry a certain expertise change repeatedly among employers, and collaborate with professionals that follow the same strategy. In type IV, the opposite applies: the individuals in the focal group have no collaboration history, but the organizations they represent have. This would occur in TOs where the involved organizations are large and have many employees. That makes it possible that even when in recurrent TOs the same organizations are involved, individuals rarely collaborate with each other repeatedly.

Both types miss out on certain coordination-enhancing mechanisms, because of the absence of either interorganizational prior ties or interpersonal prior ties. In order to assess in which type coordination will be more effective, we have to say something about the relative importance of interorganizational compared to interpersonal prior ties when it comes to enhancing coordination. A consideration of the boundary-spanning roles hints at a direction (Janowicz-Panjaitan & Noorderhaven, 2009). The coordination of tasks in a TO takes place predominantly at the operational level, where the actual working together takes place. It has been argued that at this operational level, boundary spanners' behavior is predominantly influenced by personal prior ties (Janowicz-Panjaitan & Noorderhaven, 2009). Following this line of reasoning, when it comes to enhancing coordination at an operational level, prior interpersonal ties will have a bigger effect than prior interorganizational ties. Therefore we expect that coordination is more effective in type-III TOs (where the individuals in the focal group share a history of collaboration) than in type-IV TOs.

Next we explore four ideal-typical TOs based on the presence or absence of interorganizational and interpersonal future ties (for a schematic overview, see Figure 5.2). In each TO type we explore the relative extent to which there is a chance that the individuals in the focal group (consisting of strategic boundary spanners) behave opportunistically. This exploration also searches for answers to various theoretical questions. For example, how likely is it that the focal group behaves opportunistically towards each other when they expect no future collaboration with each other, but do expect future encounters with the organizations the others represent? And what happens when the situation is reversed, where

the focal group expects future collaboration with each other but not with the organizations they currently represent?

Type V

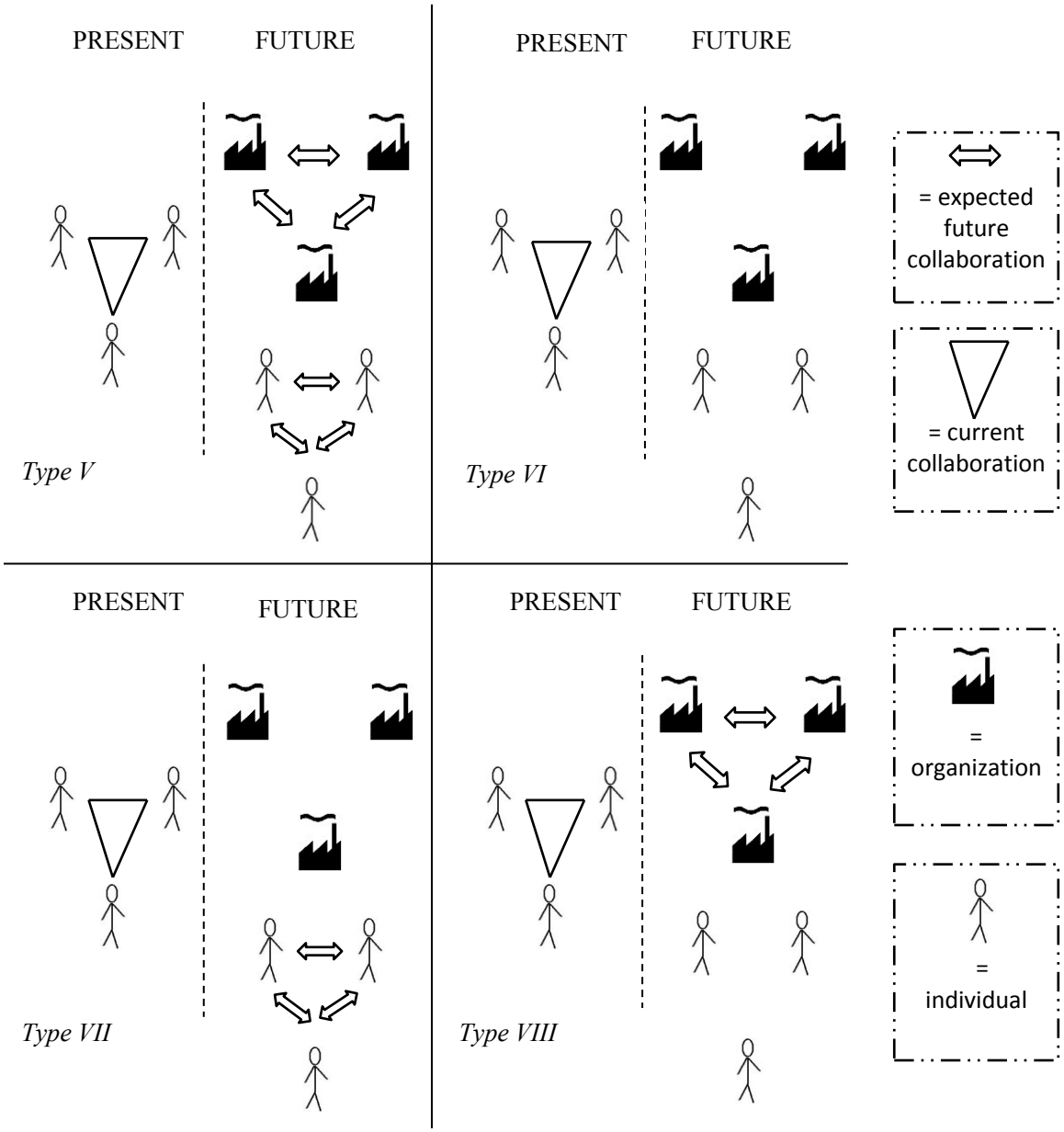
In type-V TOs, the individuals in the focal group expect to work with each other in the foreseeable future. In addition, they expect their organizations to collaborate in the future. That is, the focal group is linked through interpersonal future ties as well as interorganizational future ties. Similar to type-I TOs, this situation is likely to occur in small professional communities, where the chance on repeated collaboration between the same organizations and the same individuals is higher. Furthermore we expect the expectation of future collaboration to be fueled for a large part by prior interaction: if individuals have worked repeatedly with the same set of organizations and individuals before, the chance is high that they will expect future collaboration with them as well. The focal group's expectations of future collaboration with each other trigger mechanisms of reciprocity and reputation. In other words, they are likely to believe that they will be punished if they behave opportunistically, either directly by other individuals in the focal group, or indirectly by getting a bad reputation not only in the focal group but outside the group as well. Because this shadow of the future plays out on the interpersonal as well as on the interorganizational level, we expect the chance that the individuals in the focal group will show opportunism to be lowest in comparison to the other three TO types.

Type VI

In type VI, the individuals in the focal group expect no future collaboration with each other, nor do they expect future collaboration among their organizations. This situation can occur when organizations select new partners but find out during collaboration that these new partners do not live up to their expectations. When this occurs during collaboration, corporate-level boundary spanners may already have decided not to continue collaboration in future TOs. In this situation concerns for reciprocity or reputation are likely to be absent. Because the chance that opportunistic behavior is punished in the future is low, we posit that the chance on opportunistic behavior in the focal group is highest in type-VI TOs when compared to the other three TO-types, and that the quality of collaboration goes down.

FIGURE 5.2

A typology of TOs based on expected future ties



Type VII and Type VIII

Similar to the first typology, we discuss type VII and type VIII simultaneously. In type VII, the individuals in the focal group expect future collaboration with each other (i.e., presence of interpersonal future ties), but they do not expect their organizations to do so (i.e., absence of interorganizational future ties). While this is an unlikely scenario, it does happen. It is possible when professionals swiftly move from one employer to the next. For instance, some regions in Italy show these patterns due to intra-regional, inter-firm mobility (Capello, 1999). In this scenario, reciprocity and reputation come into play, increasing the chance that the individuals in the focal group will refrain from opportunism. The interesting question is whether the chance on opportunism in type-VII TOs is higher or lower than in type-VIII TOs. In type-VIII, the individuals in the focal group expect no future collaboration with each other (i.e., absence of interpersonal future ties), but they do expect future collaboration among their organizations (i.e., presence of interorganizational future ties). In contrast to our reasoning with respect to coordination, we expect that interorganizational ties are more important in preventing opportunism than interpersonal ties. We have two reasons to make this claim. First, in a study on interorganizational and interpersonal trust (Zaheer et al., 1998) it was found that interorganizational trust is more critical for exchange than trust between the individuals who manage the relationship. And second, similarly, it has been argued that at a strategic level, personal ties are of less influence on decisions concerning future interorganizational collaboration because these decisions are based primarily on rational-strategic instead of personal grounds (Janowicz-Panjaitan & Noorderhaven, 2009). These studies suggest that opportunism is more likely to be influenced by expectations of interorganizational future ties than by expectations of interpersonal future ties. Thus, in type VII, where interorganizational future ties are absent, the individuals in the focal group will be more inclined to behave opportunistically than in type VIII.

5.6 Discussion

The major theoretical contribution of this chapter lies in our attempt to disentangle interorganizational and interpersonal ties and their effect on coordination and opportunism. We propose that there are important differences between these ties and that the two levels should be regarded both empirically and analytically as distinct constructs (cf. Barden & Mitchell, 2007; Rousseau, 1985; Schilke & Cook, 2013; Zaheer et al., 1998). This distinction allows us to isolate the effects of prior and future ties on coordination and opportunism at

different levels of analysis. Specifically, when it comes to improving coordination we propose that prior ties at the individual level exert more influence than prior ties at the organizational level. Concerning the prevention of opportunism, we propose that expectations of future ties at the organizational level are more important than future ties at the individual level. Our proposition that interorganizational and interpersonal ties are qualitatively different from each other in combination with the observation that in the literature the two are often considered the same or are conflated, suggests that there is important research to do in the area of (temporary) interorganizational collaboration. We specifically relate interorganizational and interpersonal ties to coordination and opportunism, but to the extent that the differences between the two levels are indeed important, our propositions can be extended to other aspects of interorganizational collaboration as well.

Although this chapter is primarily driven by theoretical motives, our theorizing on the effect of interorganizational and interpersonal ties on coordination and opportunism in TOs may have practical implications as well. For example, to the extent that our ideas regarding coordination hold, organizations should try to keep the same operational-level employees tied together across TOs. This means that if operational-level employees switch employers, it could be wise for organizations to switch accordingly. The importance of repeated collaboration between individuals is argued to be less relevant at a strategic level, suggesting that organizations can relatively safely change strategic-level boundary spanners without running the risk of facing opportunistic partners.

To illustrate our typologies, we now apply them to the shipbuilding projects discussed in chapter three and four of this dissertation. Across these projects for most part the same organizations and individuals were involved, signaling the presence of recurring interorganizational and interpersonal ties, in the form of prior ties and expectations of future interaction. Therefore these projects would be classified as type-I and type-V TOs. As suggested, in these TO types coordination should be efficient and participants would refrain from opportunism. These predictions seem to coincide with our observations. Project participants indicated how relatively easy coordination was because most parties knew each other from previous collaboration. In addition to that, it turned out that there were some start-up problems concerning the coordination of the parties that entered ZeroOne as new parties. There were also some problems with the few parties that entered ZeroTwo as new parties as they did not have the experience of working together with the others on ZeroOne. This strengthens our belief that, at an operational-level, interpersonal prior ties have a considerable,

positive influence on coordination. With regard to opportunism, we came across an interesting example which showed that indeed the expectations of future interorganizational ties can prevent opportunism. On ZeroOne, one of the subcontractors made a loss among others because the costs turned out to be much higher than originally budgeted. At the end of the project, higher management of the subcontractor sat together with the head of the shipyard's purchasing department, and the shipyard decided to compensate the subcontractor's loss. They did that explicitly because they expected future collaboration with that subcontractor, and because they believed that the subcontractor would otherwise in subsequent projects try to cover its loss, for example by claiming more rework. In line with our ideas, this example suggests that at the organizational level, expectations of future interaction can prevent opportunistic partner behavior.

In trying to find answers to questions like what happens when interorganizational ties are not supported by interpersonal ties and vice versa, many more questions have risen. For example, what happens when interpersonal collaboration routines developed during prior TOs strongly deviate from the collaboration routines in other parts of the organizations? Under which conditions do the interpersonal collaboration routines take over characteristics of the other routines, and when do they persevere? Future research may explore these questions, which is believed to give important insights in the institutionalization of collaboration routines (e.g., Lawrence, Hardy, & Phillips, 2002; Zaheer et al., 1998), or the development of a macroculture (e.g., Abrahamson & Fombrun, 1994). Also, to reduce complexity we explored one typology based on prior ties, and another one based on future ties. However, TO participants will simultaneously take into account prior collaboration and expectations of future interaction. Future research may address more complex typologies to do more justice to the complexity of interorganizational life. Furthermore, our TO typologies constitute a fairly static approach in the sense that they do not encompass the experiences gained by the focal group during a current TO. One can argue that during collaboration – apart from prior ties and expectations of future interaction – behaviors by individuals are also influenced by their experiences in that specific TO. It has been argued for instance that during collaboration, firsthand experiences of TO participants can outweigh their initial assessments of other participants (Schilke & Cook, 2013). Future research then could benefit from taking into account multiple time elements, i.e. not only the time before TO initiation and after TO termination, but also the period between these two time brackets.

The ideas developed in this chapter call for empirical investigation. Although empirical examination of the proposed ideas will be quite a challenge, we believe the pay-off can be substantially. It can provide new theoretical insights in the area of temporary interorganizational collaboration, and it can provide company executives with interesting new ideas on how to effectively structure collaboration.

6. Conclusion and discussion

6.1 General conclusion

This dissertation set out to explore collaboration practices in and across interorganizational temporary organizations (TOs) and to contribute to the isolation-embeddedness discussion in the TO literature. In this final chapter we answer the research questions formulated in Chapter 1 and discuss our contributions. The overall research question was fairly broad:

Which factors are critical to our understanding of collaboration practices in and across interorganizational temporary organizations?

To answer this question we first formulate answers to the related sub-questions addressed in the empirical chapters. These questions were:

- *Which factors explain collaboration inertia in a TO-based industry over time?*
- *Which factors explain (in)flexibility in social interaction in TOs?*
- *Why does learning across two specific, subsequent TOs fail or succeed?*

With regard to the first sub-question, we have shown that history plays an important role in explaining collaboration inertia through mechanisms of path dependency. Over time, collaboration practices are produced and reproduced, creating a situation in which these practices become taken for granted by the collaboration actors. Concerning the second sub-question, we have shown that next to a present-time orientation, which in this context means TO participants' focus on the time remaining until TO termination, the past and future influence flexibility and inflexibility in TOs. The past reflects prior collaboration between TO participants, while the future is reflected in terms of a shadow of expected future interactions. Regarding the third sub-question, we have shown that learning failures occur when TO participants face external change responsibility in combination with unaligned change incentives. Learning successes are likely to take place when TO participants have internal change responsibility, or when in the case of external learning responsibility, change incentives are aligned.

These answers build up to an answer to the overall research question, resulting in the general conclusion of this dissertation: **time and the alignment of change incentives are critical factors in explaining collaboration practices in and across temporary organizations.**

We posit that aspects of time are central factors in explaining the functioning and the outcomes of TOs but not exactly in the way one would expect on the basis of the TO literature. This literature emphasizes the importance of TOs' ex ante defined termination point in determining behavior of its participants. It stresses that the impending termination of TOs makes participants oriented towards the time remaining for task completion until TO termination. Consequently TO participants would develop a strong focus on the task at hand, without thinking much of what happened before TO initiation or about the period after TO termination. It also puts forward however that this present-time orientation inclines participants to pursue self-interests at the cost of the overall TO interest. The impending termination of TOs can thus facilitate or hamper effective collaboration and joint goal accomplishment. In Chapter 3 we find support for the collaboration-enhancing argument that due to TOs' impending termination TO participants develop a focus on the task at hand. But, based on our findings, we do conclude that the effect of the ex-ante defined termination point is mitigated by shadows of the past and future. First, a shadow of the past is an important predictor of the present-time behavior of TO participants. This may not be surprising since generally people are creatures of habit. They behave according to how they are used to behave. In the multi-organizational context of TOs a shadow of the past can lead to a collaboration culture that is very difficult to alter. That at least partially explains why collaboration in the Dutch shipbuilding industry is characterized as suboptimal. Shipyards and subcontractors are used to a certain way of working, which they more or less automatically adhere to (see Chapter 3) even when collaboration demands have changed over time, making their practices less efficient (see Chapter 2). Second, a shadow of the future also influences the current behavior of TO participants. A shadow of the future restricts the range of possible behaviors. The expectation and/or willingness to work together with the same organizations and individuals inclines TO participants more strongly to take into account the interests of others beyond their self-interests. This is reflected for example in flexible behavior during the execution of shipbuilding projects (see Chapter 3), and could explain why we found no evidence for the possible negative effect of TOs' impending termination on collaboration. Thus, by working together time after time, shadows of the past can mitigate the possible influence of TOs' ex ante defined termination on end-game behavior by the transfer of

collaborative behaviors from one temporary organization to another. Shadows of the future can mitigate this influence by lowering the incentives to behave opportunistically (see also Chapter 5).

Apart from the importance of shadows of the past and future we need to take into account another major factor for explaining the functioning and outcomes of TOs, which is not related to time. Especially with regard to learning across TOs – or preventing that ineffective practices occur time after time – alignment of change incentives of TO participants seems to be critical (see Chapter 4). The involvement of multiple, legally independent but functionally interdependent organizations creates some level of conflicting interests, of which change incentives are but one example. Current TO literature acknowledges the difficulty of aligning incentives. What we show is that this condition can play a dominant role in the functioning of TOs, making them less effective than when incentives would be aligned.

6.2 Theoretical implications

The central theoretical problem as discussed in the Introduction of this dissertation concerns the discussion in the TO literature regarding isolation or embeddedness. Basically there is one stream of literature that considers TOs to be unique and isolated from their environment, and another stream that emphasizes the importance of the context or environment of TOs for their functioning (e.g., Engwall, 2003; Löwendahl, 1995). Our findings strongly support the latter viewpoint. This is in line with an increasing belief that the study of TOs shifts from the traditional focus on management 'within' TOs to a focus on the context and embeddedness of TOs (Morris, Pinto, & Söderlund, 2011). Accordingly, we make the claim that TOs, at least in the context we studied, are not one-off, closed systems. Instead, we view TOs as open systems embedded in multiple ways, in particular by prior relations between TO participants and expectations of future interactions among them, at both the organizational and individual level. Adopting this viewpoint has several implications for theorizing on the functioning of TOs. One of the early and influential contributions to theorizing on TOs comes from Lundin & Söderholm (1995), who depicted time, task, team, and transition as four central elements of temporary organizing. More recently Bakker (2010) revisited these elements and proposed to discard the transition concept in favor of 'embeddedness'. In this dissertation embeddedness appears as a central element as well. Therefore in the following we discuss the implications of viewing TOs as open systems for the functioning of TOs by zooming in on the elements of embeddedness, time, team, and task, respectively.

6.2.1 The effects of embeddedness on collaboration practices in and across TOs

Increasingly it is suggested that the functioning of TOs cannot be considered without taking into account the context in which they operate (Engwall, 2003; Grabher, 2002b; Sydow & Staber, 2004). The chapters in this dissertation reconfirm this viewpoint, at least for the empirical context studied. Aspects of embeddedness can both facilitate and hamper collaboration practices in and across TOs. On the positive side, embeddedness in the form of shadows of the past and future creates familiarity among TO participants which improves coordination and lowers the chance on opportunism. On the negative side, shadows of the past make it difficult for TO participants to break away from ineffective collaboration practices. A remaining gap in the literature concerns the conditions under which prior relations between TO participants improve, rather than impede, the functioning and performance of TOs (Schwab & Miner, 2008). We propose that a major factor in this respect is the alignment of change incentives of TO participants (see Chapter 4). If these incentives are not aligned, it will be difficult to make fundamental changes across TOs, creating suboptimal levels of collaboration and thus suboptimal performance. If these incentives are aligned, change is more likely to come about, which in turn can increase performance. In addition to these findings, we contribute to the embeddedness theme by also taking into account future ties. When discussing repeated ties, most studies stick to history of interactions (e.g., Sorenson & Waguespack, 2006), without taking into account expectations of future interaction. As future ties have been proposed to sometimes influence TO behavior more than prior ties (e.g., Poppo et al., 2008), a simultaneous comparison of shadows of the past and future is advisable. We have undertaken such an attempt in this dissertation (see Chapter 5), and tried to take it to the next level by not only distinguishing between prior and future ties, but also between ties at the interorganizational and the interpersonal level of analysis.

6.2.2 The effects of time on collaboration practices in and across TOs

In the context of TOs, time has been depicted as short or limited, but at least different in its influence from that on other, non-temporary organizations (Bakker, 2010). Yet the most important gap in the literature is considered to be empirical studies of the effect of temporariness on the functioning of TOs, because most of the work on this topic is of a conceptual nature. We have shown that time is a multi-faceted phenomenon. Within TOs time is limited which creates a sense of urgency among TO participants (Saunders & Ahuja, 2006). Based on our analyses, we agree that time limits result in a strong orientation towards the task

at hand. But we challenge the idea that these time limits form the unique influence of time on the functioning of TOs. We posit that apart from these time limits, the influence of the time before TO initiation and the period after TO termination on project participants has considerable explanatory power as well. Collaboration practices in TOs, then, are influenced not only by specific TO characteristics such as the ex-ante defined termination point which creates a present-time and task orientation of TO participants. Instead, collaboration practices in TOs are also dependent on forces outside of the TO such as shadows of the past and the future.

A second identified gap in the literature on TOs concerns how TOs develop over time (Bakker, 2010). This development can relate either to the changes in collaboration practices in a single TO (Packendorff, 1995) or to changes across multiple TOs (Bakker, 2010). Concerning changes within a TO, the inevitably approaching deadline of TOs has been considered to change the patterns of collaboration (Ness & Haugland, 2005). However, we have shown (see Chapter 3) that in the projects we studied collaboration practices hardly changed during TO life cycles. This suggests that TO participants have developed certain practices during previous TOs, take these practices with them to subsequent TOs, and do not change them much as a result of for instance impending deadlines. Again, this supports the view that TOs are not isolated phenomena and that collaboration practices are influenced not only by specific TO characteristics but by external forces that operate outside TOs as well. It also shows that the temporariness of a given TO may not be as influential on the participants' behavior as assumed in much of the literature. These external forces can also help explain why learning across TOs that often necessitates changing collaboration practices is difficult to achieve. TO participants are used to being in a working environment in which multiple organizations with multiple interests collaborate. That makes it difficult to implement changes across TOs and explains why – as these difficulties arise time after time – TO participants may resign from active attempts to bring about change (see Chapter 4). On a macro level, TO-based industries can also have difficulties to change collaboration practices. We have shown that in this case too, the past plays an important role by creating collaboration inertia through mechanisms of path dependency (see Chapter 2).

In sum, the various elements of time can both facilitate and frustrate collaboration in and across TOs. Past time can facilitate collaboration in TOs when successful practices are reproduced over time, but it frustrates collaboration when through a shadow of the past TO participants cannot break away from suboptimal collaboration practices. While past time can

have both positive and negative effects, it seems that expectations of future interactions predominantly facilitate collaboration through the mechanisms of reciprocity and reputation. TO participants' orientation on the present time can both increase and decrease the quality of collaboration (see Chapter 3).

6.2.3 The effects of team composition on collaboration practices in and across TOs

With regard to the team aspect of interorganizational TOs, a major concern has been that because of TOs limited duration, TO participants lack the time to develop collaboration practices for instance by engaging in trust-building activities, which is considered important for effective collaboration in interorganizational settings (Meyerson et al., 1996). However, through the influence of shadows of the past and the future (see Chapters 3 and 5), this is less of an issue than might be expected because TO participants are likely to have collaborated before and expect future collaboration. This is in line with other work that accentuates the importance of lasting ties across TOs (e.g., Jones & Lichtenstein, 2008; Sydow & Staber, 2002). The notion of 'swift trust' (Meyerson et al., 1996), which can be described as presumed trust rather than trust based on shared experiences, seems therefore only significant when shadows of the past and future are absent.

Another concern has been that the involvement of multiple organizations with diverging interests in the project team creates frictions. We adhere to this viewpoint by showing that organizations participating in Dutch shipbuilding projects have to deal with conflicting interests as well. For example, shipyards seem unwilling to give up their dominant position and to grant more influence on the production process to the subcontractors, even though these subcontractors increasingly have knowledge that is central to the process. On the other hand, a distribution of decision-making power would also involve a distribution of the financial risks, which are currently carried predominantly by the shipyards. It seems that subcontractors are not that eager to take on parts of this risk. This combination of unaligned incentives seems to create a status-quo situation that may be suboptimal, but which triggers none of the involved parties to actively strive for (fundamental) change (see Chapter 2).

In sum, team composition can facilitate and hamper collaboration practices in and across TOs. The inevitably diverging interests which are a consequence of the involvement of multiple organizations can lead to ineffective collaboration when TO participants try to maximize their own profits at the expense of others. However, having the same organizations involved across TOs can mitigate this effect through mechanisms of reciprocity and reputation.

6.2.4 The effects of the nature of the task on collaboration practices in and across TOs

Tasks justify the very existence of TOs (Lundin & Söderholm, 1995). These tasks often are complex (Brady & Davies, 2004), which is why the inputs of and collaboration between multiple expert organizations are required. While tasks in the context of TOs first were portrayed as relatively unique (Goodman & Goodman, 1976), more recently it has been suggested that TOs can also execute similar tasks across subsequent TOs (Brady & Davies, 2004). To a certain extent the tasks performed in the Dutch shipbuilding industry can be considered routine tasks as they all concern producing (similar types of) vessels. This routinization of tasks has been argued to facilitate collaboration for instance by lowering learning barriers (Scarbrough et al., 2004). In line with this we found that collaboration can become more efficient when tasks executed in subsequent TOs are similar (see Chapter 4). Yet, with task routinization comes the routinization of practices and this can equally well hamper collaboration if these practices are suboptimal. To the extent that TO participants are used to a dominant way of carrying out and accomplishing tasks, they will find it difficult to change their practices (see Chapters 2 and 4). Thus, we propose that the execution of routine tasks can both facilitate and hamper collaboration in and across TOs.

6.3 Practical recommendations

Our findings suggest some practical recommendations on how to improve interorganizational collaboration practices in and across TOs in general and in and across shipbuilding projects in particular. An important recommendation would be to strive for repeated collaboration with the same set of organizations and individuals. This paves the way for the development of collaboration routines and lowers the chance on opportunism. For example, we found out that during the projects under study a subcontractor was compensated for his loss by the shipyard as a way of looking after each other and backing each other up. However, there is a trade-off between the advantages of repeated collaboration between a given set of organizations and the advantages of competitive bidding, which was outside the focus of this dissertation but should be taken into account by practitioners. Moreover, repeated collaboration in itself is not a sufficient condition to improve collaboration. A critical step in coming to optimal collaboration between TO participants is aligning their interests. In the Dutch shipbuilding industry, the unaligned interests seem rooted in the past and taken-for-granted, making it extremely difficult to alter the situation. However, for the industry new ways of collaboration are considered key in achieving optimal interorganizational collaboration:

"It is absolutely clear that we still do not make the most of collaboration between shipyards and subcontractors. It is not catastrophical, and it does get better, but still there lies a major challenge. One of those challenges is the development of a business model in which subcontractors play a new role. Subcontractors need to become a partner, and share the risks accordingly. In that area there is still ample room for improvement." [Retired shipyard executive]

In the quote above a collaboration model is proposed, in which risks are shared among shipyard and subcontractors. Such collaborations are common practice in for instance the Japanese car industry (e.g., Okamuro, 2001) but are currently not present in the Dutch shipbuilding industry. This risk-sharing principle could be a way to align interests as it causes ineffectiveness (e.g., failure to learn across shipbuilding projects, inflexible behavior) to harm not only the shipyard but the subcontractors as well. That in turn should motivate all parties to behave not only according to their self-interests, but also to take into account the interest of others as well as the overall interest. It could be a way to deal with the complexity of temporary interorganizational collaboration and the inherently conflicting interests between the parties that are involved in the production of complex vessels. Furthermore, while technical innovations (state-of-the-art machinery, innovative software and methods) are vital to the competitiveness of project-based industries, the social component that is often neglected appears to us to be equally important in optimizing collaboration practices in and across TOs.

6.4 Limitations and future research

Above and beyond the limitations of the individual chapters in this dissertation, we next discuss some general limitations which can be addressed in future research. First of all, the explorative, case-study approach in this dissertation has served its purpose well: gaining detailed insights in a relatively underexplored phenomenon. However, it has been argued, and we concur, that now the time has come to integrate the findings of in-depth studies on temporary interorganizational collaboration to see what we have learned so far and what remains to be explored (Bakker, 2010). Future research should also incorporate large-scale, quantitative analysis. Such research can for example attempt to test the relative influences of past time, future time, and present time, and their possible interaction effects on collaboration in and across TOs.

Second, the focus of this dissertation has been solely on TOs, which are considered unique collaboration types because of their temporary nature. One may wonder to what extent TOs really are different from other interorganizational collaboration types like alliances and joint ventures. Future research could explicate the similarities and differences between the functioning and outcomes of TOs versus alliances versus joint ventures. This will shed light on the extent to which these various collaboration types indeed are unique. In addition, similar findings could be aggregated into what could form a meta-level theory of interorganizational collaboration.

Third, this dissertation did not systematically examine the relation between TOs and parent organizations (POs). On the one hand these parent organizations are part of the environment of TOs and as such can have an impact on the functioning of TOs (Modig, 2007). On the other hand, it is argued that TOs can develop an endogenous logic of functioning that is different from established routines of parent organizations (Kenis et al., 2009). Our analysis in Chapter 3 is specifically focused on the relation TO-TO instead of TO-PO. The analysis suggests though that TOs indeed can develop collaboration routines that are not necessarily in line with PO routines. But they are in line with routines in previous TOs, signaling a bigger influence of the past on current collaboration in TOs than of parent organizations. Future research may take a closer look at the interrelationship between TOs and parent organizations and how this impacts TO functioning and outcomes.

Fourth and finally, in comparison to intraorganizational TOs, interorganizational TOs are an understudied phenomenon (Lundin & Söderholm, 1995). Future research could examine the differences and similarities between interorganizational and intraorganizational TOs. The main elements identified in this dissertation (past time, present time, future time, change incentives) may be applicable to intraorganizational TOs as well. Prior relations between members of different departments and expectations of future interaction among them are anything but unlikely, creating shadows of the past and future. In addition, the interests of the various departments may be strongly diverging, creating frictions between the departments similar to the frictions present in their interorganizational counterparts.

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Appendix A: Data supporting interpretations of IO project practices and demands

Theme	Representative quotes
	Changes in IO project demands
Historical project demands	**Low interdependence / Few partners involved in the project:** "The most important thing is that in that time the yard wanted to do everything on its own. They had their own painting companies, own electrical division. They controlled everything by themselves." [Retired shipbuilder] "We employed everyone, our own painters, scaffold builders, and ship carpenters. (…) We outsourced very little." [Retired shipbuilder] **(Positive) Economic sensitivity / Long production cycles:** "And my boss said to me 'there's a bunch of papers, good luck'. Those were all specifications for ships. In that period economy was doing so well that shipping companies stood in line for shipyards. We simply couldn't find the time to handle all the customer requests." [Retired shipbuilder] **(Negative) Economic sensitivity:** "In times of economic decline, one had to fire employees on a large scale to keep one's head above water." [Government report on Dutch maritime industry]
Contemporary project demands	**High time pressure:** "The pressure of work is quite high. You've got a time-limit that is just very tight. We work with schedules from which you know beforehand: well, I hope we're going to make that." [Technical manager Shipyard] **High interdependence / High technical complexity:** "Who is designing something? Who is delivering something? Who is connecting it? Who is commissioning it? And it was very clear from the start so every time we had a discussion, we just opened the demarcation: no, it is yours. You have to sort it out. And it saved a lot of discussions." [Project manager Electric] **Many external partners involved:** "Subcontractors became more and more important because the entire functioning of the vessel is dependent on the performance and quality of the subparts. So their importance and influence with regard to profit and risk grew immensely." [Maritime researcher]

	Changes in IO project practices
Historical project practices	**Trust-based coordinating / Operating through informal networks:** "There was only one supplier, for electrical installations, that was important. That is called subcontractor right? I don't believe he cheated us. We had a very good relationship with him." [Retired shipbuilder] "They saw each other often in the church on Sunday. Trust developed there. The contract is a document, you need to have it, but it is only for emergencies. You do not use it in every-day practice." [Maritime researcher] **Emphasis on common pride:** "It [shipbuilding] used to be much more goal-driven. Everybody was glowing with pride at the moment a ship sailed away for the first time. It has changed from a shared, common pride of that ship sailing away to how can I write my contracts in such a way that it is to my own advantage. It all has become less open." [Retired shipbuilder] **Operating through informal networks / Problems referred to higher hierarchical levels:** "Whenever the board of directors of site X came over to talk to the board of directors of site Y, they always dropped by at our department and said: you guys work together, we'll do the fighting at the top. You maintained good relations with those guys." [Retired shipbuilder] "I think that between yard and subcontractor there were always informal arrangements, it's always a matter of give and take. That one [project manager] says 'ok, if you do this task for me then I won't bother you about that thing'. It's often the most efficient way to get a result." [Retired shipbuilder] "It could be that the project manager had a row with the project manager of the subcontractor, for example, because he lagged behind on delivery times or quality. But because sooner or later you had to deal with each other again, the board of directors had to make sure the conflict didn't get out of hand." [Retired shipbuilder] **Emphasizing informal contracting:** "The rivalry between the Dutch shipbuilders in those days was legendary. In the eyes of outsiders they were bitter rivals. Behind the written contrasts institutionalized cooperation was hidden." [de Voogd, 1993]

Contemporary project practices	**Emphasis on (financial) self-interest:** "Everyone is fighting for his own purse. And that is not unhealthy, I think. But the atmosphere is quite different. Because the atmosphere is no longer about how we are going to solve it but more about: if you want me to do something it will cost you." [Head project management Electric] "People are more and more looking up their own alley. This part is finished within the allocated hours so I am done with it. If I have to step it up to make it more efficient somewhere else, I will put in more hours and I am evaluated by that so I rather don't." [Technical manager Shipyard] "The more product complexity increases, and the available time decreases, the more you have to move towards collaboration in which risks are shared. The same goes for financial risks. That is a learning process for both parties. It also means there has to be trust, you let them look behind the scenes, and people have to dare. And I have to admit it is laborious." [Commercial director Shipyard] "I used to check all the drawings but eventually I thought: this is not my job, I don't get paid for this. So now we use more materials, it increases the cost price" [Contract manager Electric] **Shipyard acting as lead organization / Less trust-based coordinating:** "We are seen as the troublesome subcontractor, who tries to keep things covert, something we have to do because as soon as we tell something they take it to the competitor, and then we are left empty-handed. That just happens. Drawings are copied and given to the neighbors. What is your price? (…) Then you don't put everything on drawing." [Contract manager Electric] "When the yard's project manager and the subcontractor's project manager share the responsibility, you can get improvement. But that discussion never came to a good end. Nobody wanted to make concessions. Then it stops. As long as responsibility resides with one party, that party will take the decisions, because he is responsible for profit and loss." [Retired shipbuilder] **Emphasizing formal contracting / Emphasis on (financial) self-interest:** "It is much easier if you can arrange things on the production floor, much and much easier. But today that is no longer possible. Today everything needs to

	be confirmed by email and backed up with pictures. That is really a trend that has become visible over the past few years. You can make informal arrangements with a person but it can have major consequences when these commitments are not met. Because when the work is not done, it costs us time and money." [Production supervisor Painting] "Currently, I see how lawyers get bogged down in contracts, that they are nitpicking each other. That is nothing but distraction from the real goal: to build a ship together." [Retired shipbuilder] **Shipyard acting as lead organization / degree of outsourcing / Emphasis on formal contracting:** "The contracts between shipyard and subcontractor go pretty far, because they spell out in detail a subcontractor's functionality and supply scope, but also a demarcation list with activities. And they do that for every subcontractor. And the structure of the contract and the purchasing conditions are written down in such a way that you as a subcontractor have no say in the overall picture. The shipyard outsources 70% of the entire vessel to subcontractors, but these subcontractors have no influence on the building process. (…) No matter for what reason, if there are problems with the planning that cause you to start your work later, can deliver later, and hence need to put more time and effort in your job, you cannot call the shipyard to account for that extra time and effort." [Head project management Electric]

Appendix B: Example of observation protocol ZeroOne

OBSERVATION PROTOCOL	
Observation Details **Project meeting** **March 6, 2012** **11.00 hrs – 12.13 hrs**	
Descriptive notes (factual observation, what do we SEE?)	**Reflective notes** (reflection and opinion on what we see)
Subcontractor: Often I see personnel from [subcontractor X] walking around the accommodations with pipes longer than two meters while the accommodations are finished. I thought that was not what we had agreed upon.	Perceived rigidity concerning procedural requests.
Subcontractor: One of our guys from the office is waiting for information. Production supervisor shipyard: I need to check that, and then I will come back to you.	Request for information, positive response.
Subcontractor: Do we have to paint that area or is that in the scope of [subcontractor X]?	Flexibility concerning scope of work.
Subcontractor: I come back in the evening to finish that job.	Flexibility concerning time.
Shipyard: This vessel cannot be handled as a standard vessel because it is twice the size. So everybody needs to increase pace.	Flexibility request concerning increase of pace.
Subcontractor: the coming days we will put in overtime to make up for the loss in time.	Flexibility concerning pace.
Subcontractor: Can we start today in the technical space? Shipyard: no that is not possible, the guy who is responsible for that room has been ill for a few days, and I have no one else to do that job.	Defiance, rigidity concerning pace and timing of activities.

Appendix C: Data supporting interpretations of flexibility requests

Theme	Representative quotes	Source
	Flexibility requests	
Requests concerning scope of work	"It had to be isolated, but it was not on the original isolation plan." [Shipyard Engineer]	Int.
	"We had to pull all the cables from two rooms and bring them back in again." [Production supervisor Electric]	Int.
	"Sometimes I need to put effort and time in adjusting someone else's unit." [Production supervisor HVAC]	Int.
	"Then we have finished one room, but then we come back the next day and there are holes everywhere because extra clicks had to be assembled." [Production supervisor Painting Interior]	Int.
	"I know that this room has been isolated already, but I still need to do some things there. So I will make some damages that causes you some rework." [Production supervisor Electric]	Obs.
Requests concerning pace and timing of activities	"They tell me to make sure that I have got enough people for the job." [Production supervisor HVAC]	Int.
	"Usually they ask me if I can put more people on the job or if I can put in some overtime." [Production supervisor Electric]	Int.
	"Everyone has to crack it up a notch." [Production supervisor Shipyard]	Obs.
	"Then they ask us if we can paint their clips first, which is then usually at the earliest moment possible." [Production supervisor Painting Interior]	Int.
	"Between the subcontractors it goes continuously 'can you do this now, can you do that now?'" [Production supervisor Painting Interior]	Int.
	"I perform that task in the evening, because then there is nobody there." [Production supervisor Electric]	Obs.
Requests for Information	"We ask them for information on how to do our work." [Production supervisor Piping]	Int.

	"If you encounter things that are not on the drawings, please inform me so I can put it on paper." [Engineering Shipyard]	Obs.
	"Can you send me that list with items?" [Production supervisor Navigational Equipment]	Obs.
Requests concerning general procedures	"We have agreed that every Thursday afternoon, all parties put some effort in cleaning the ship. This is not a request without obligation. We have a housekeeper on board, but he is only responsible for regular cleaning activities like emptying garbage cans." [Project manager shipyard]	Obs.
	"Is everybody cleaning their own mess on board? I don't think so. I want to ask everyone to keep an eye on that." [Project manager Shipyard]	Obs.

Int. = interviews
Obs. = observations

Appendix D: Data supporting interpretations of responses to flexibility requests

Theme	Representative quotes	Source
	Responses to flexibility requests	
Acquiescence	"Sometimes it is about just pulling one extra cable. Then of course I do it, and we do not charge them for it." [Production supervisor Navigational Equipment]	Int.
	"If something simple is damaged, we repair it without further consequences." [Production supervisor Paining exterior]	Int.
	"This flexibility is who we are, how our people work. We are flexible not only towards this shipyard, but towards everyone we work with." [Project manager Isolation]	Int.
Compromise	"If they have damaged our work, or we are asked to do additional work that differs from what was on the original drawings, then I take a note of that. I write down our additional hours and materials and that goes to the office." [Production supervisor Isolation]	Int.
	"That is going to weigh in for the budget." [Production supervisor Navigational Equipment]	Int.
Defiance	"Not every subcontractor is able to increase pace to the extent we wish for." [Project manager Shipyard]	Int.
	"I ask them a list which says which cables I need to pull. If I need to sort that out by myself, it costs me more than a day work. While they are sitting behind their desk and with a few mouse clicks they can generate such a list. But they just won't do that." [Production supervisor Electric]	Int.
	"It happens that I cannot respond positively to information requests. Then I tell them I am sorry." [Production supervisor Electric]	Int.
Avoidance	"In the beginning of the project, we have decided that every Thursday afternoon everyone would help cleaning the mess on board. Currently this is not going to my satisfaction. Therefore I would like to request again to make sure that you leave the vessel only when you are finished cleaning the room where you have been working." [Project manager Shipyard]	Obs.

	"I have heard that there are people sandpapering the wheelhouse without covering entries. That is just totally unacceptable." [Project manager Shipyard]	Obs.

Int. = interviews
Obs. = observations

Appendix E: Data supporting interpretations of drivers of responses to flexibility requests

Theme	Representative quotes	Source
	Drivers of responses to flexibility requests	
Present-time orientation	"If you take up these issues like a team, it builds much better." [Production supervisor Navigational equipment]	Int.
	"It is in no one's interest to withhold information from one another." [Production supervisor Piping]	Int.
	"Between the parties on board it goes continuously 'Can you do this for me now, can you do that for me then?' Then we do not wait for the project meetings, we just take care of it, and it accelerates the entire process." [Production supervisor Painting Interior]	Int.
Shadow of the past	"This flexibility is who we are, how our people work. We are flexible not only towards this shipyard, but towards everyone we work with." [Project manager Isolation]	Int.
	"Flexibility has been the credo of our company ever since the beginning. When I started working here 27 years ago, it was already like that. If something had to be done on Saturday, you were there. You would get a telephone call 'we have had an accident, the oil tank is leaking'. You went there and fixed what had to be fixed." [Project manager Painting Interior]	Int.
	"Our CEO breathes flexibility. He used to work for a company where he could move five degrees left, five degrees right, but no further. And if he decided to go beyond that, he had to explain it to his bosses. At one moment he decided he didn't want that anymore, so he started for himself." [Project manager Navigational Equipment]	Int.
Shadow of the future	"The subcontractors are eager to get selected for subsequent projects. So we can tell them 'listen, more projects will follow, but then we do need you to put in some extra effort on this vessel'. That works very motivating." [Project manager Shipyard]	Int.

	"If we would behave rigidly, the shipyard would soon kick us out. If our behavior costs them money, they will start looking for others to do the job. So they are pretty powerful." [Project manager Electric]	Int.
	"We cannot afford it to be inflexible with regard to these types of requests because I think that if I do so, soon I will be employed somewhere else." [Production supervisor Painting Interior]	Int.
	"If you behave rigidly your company will get a bad reputation. Consequently, you don't get subsequent projects. So we are kind of trapped, if we stick to our guns they will look for others." [Project manager Navigational Equipment]	Int.
Ability to be flexible	"Not every subcontractor is able to increase pace to the extent we wish for. This yard is used to work with relatively small firms, while the current project is a very large vessel. And we give subcontractor X assignments that take up 110 or 120% percent of their capacity." [Project manager Shipyard]	Int.
	"Our company gives us complete freedom concerning the number of people we use, when we do the spraying, when we do this, when we do that, when we put in overtime. And we have so many of our employees walking on the projects at this shipyard, it is easy to pull a guy from one project to let him do some work on the other project." [Production supervisor Paining Interior]	Int.
Time pressure	"It happens that I cannot respond positively to information requests. Then I tell them I am sorry, but I just do not have the time to do it. You see, the last couple of weeks eight hour working days are not sufficient for me to finish my job. So I work twelve hours a day. And I come back every Saturday morning. Just to finish the work that needs to be done." [Production supervisor Electric]	Int.

Int. = interviews
Obs. = observations

Appendix F: Example of observation protocol ZeroTwo

OBSERVATION PROTOCOL	
Observation Details **Project meeting** **January 29, 2013** **13.15 hrs – 14.21 hrs**	
Descriptive notes (factual observation, what do we SEE?)	**Reflective notes** (reflection and opinion on what we see)
Shipyard engineer: We are still working on what the dive area is going to look like. Electrical subcontractor: How did they solve that on the previous vessel? Shipyard engineer: I am not sure, I need to check the drawings.	Explicit reference to ZeroOne concerning what the vessel is going to look like: similarities between ZeroOne and ZeroTwo
Carpenter: Can we sort out our panels on the large deck? Production supervisor Shipyard: I think it is best if we do it the same as last time. But we have to look at the situation once you begin with that.	Explicit reference to ZeroOne concerning procedures: similarities between ZeroOne and ZeroTwo
Carpenter: We need to make hatchways; the ceilings are going to be slightly different in comparison to the first vessel. So we need to put our heads together for that.	Explicit reference to ZeroOne concerning what the vessel is going to look like: differences between ZeroOne and ZeroTwo
Production supervisor Shipyard: On ZeroOne we walked around the entire vessel to make photos, I think that is a good idea to do on this vessel as well.	Explicit reference to ZeroOne concerning procedures: similarities between ZeroOne and ZeroTwo
Engineer shipyard: Last time this was drawn incorrect. Now we have made separate drawings.	Explicit reference to ZeroOne concerning procedures: differences between ZeroOne and ZeroTwo

Appendix G: Data supporting interpretations of conditions influencing cross-TO learning

Theme	Representative quotes	Source
Locus of change responsibility	<u>Internal change responsibility</u>	
	"Now I have the experience from the previous vessel. I know what the showstoppers were, and now I recognize these things much earlier so it is easier for me to adjust things on time." [Production supervisor Carpentry]	Int.
	"Now my men know which situations brought troubles last time and how they handled those situations. And now they can act immediately." [Production supervisor Piping]	Int.
	<u>External change responsibility</u>	
	"We received information fairly late from the shipyard, because they were still busy with the drawings. And if you don't have the information, it is very hard to carry out your work. And if then you find out afterwards that a socket has changed, it is difficult if that already has been installed." [Production supervisor Carpentry]	Int.
	"There are always problems with getting materials delivered on time. And that is a consequence of the involvement of so many parties. Our engineering department can be late, but it can also be that the material coordination department waits too long, or that the purchasers are responsible for delays. And also the supplier can be late." [Production supervisor Shipyard]	Int.
Alignment of change incentives	<u>Aligned change incentives</u>	
	"I told the production director this was not going to work in the future. We were just overloaded with work so we needed additional capacity. The production director agreed on this and also felt something had to change. Then he asked me how I though the situation could be improved." [Production supervisor Shipyard]	Int.
	"I talked to our production supervisor and that of the subcontractors how they experienced planning on the first vessel. And then I combined all the input. Now the planning serves as a handle for	Int.

	everyone, and collaboration is much more efficient." [Project manager Shipyard]	
	<u>Unaligned change incentives</u>	
	"Now we are stuck with the garbage store and the diving area, they need to be painted. But we received information on those compartments late, so we are not finished before the painting, although that was our intention. So that means we need to weld afterwards, and that will give damages. But that is something you cannot really escape from." [Production supervisor Piping]	Int.
	"I think group evaluations with all the subcontractors are rather pointless. What happens then is that every subcontractor starts complaining about what has frustrated them during the process. But that does not solve the overall problem." [Production supervisor Shipyard]	Int.
	"We have on this vessel more repair work in comparison to the previous vessel. That is I guess because the owner wants additional things, and then the shipyard passes on these requests." [Production supervisor Painting Exterior]	Int.

Int. = interviews